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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Future of By-Product Ammonia

LAST week we dealt with some comments in the British Sulphate of Ammonia Federation's annual report on the future of the by-product ammonia industry. Something, of course, is always to be said on the other side, and several points have since been put to us, which are indicated below. However critical the situation at present may seem to be, many by-product manufacturers hold that it can be successfully met, if the correct course of action is pursued. Mass production is the order of the day. If it were possible to confine the production of by-product ammonia to one factory, in the same way that the production of synthetic ammonia in this country is being concentrated at one point, there are some who even claim that the by-product ammonia industry might obtain the controlling interest. This, of course, presupposes that international agreements would be reached, by which well-defined territories would be judicially assigned, so that keen-cut competition from the German or other synthetic ammonia works could be largely eliminated. That some such tacit arrangement exists to-day seems obvious. As it is physically impossible to concentrate the production of by-product ammonia at one factory, the nearest approach to this ideal would be a few centrally situated works throughout the country. Whatever advantage these works might lack in point of mass production, some compensating gain would accrue in the reduction of costs of distribution. Gasworks and coke ovens alike must recognise that they have common interests; that the bulk treatment of their production of by-product ammonia is imperative. To produce sulphate of ammonia at 400 or 500 different works, in comparatively small quantities, is to defeat their own object. This fundamental mistake was pointed out at least three years ago. What was then foreseen is now the subject of emphatic remark by the British Sulphate of Ammonia Federation, when it refers to the varying colour and condition of by-product sulphate of ammonia, which render its sale more difficult.

From the by-product point of view, the question has been put to us—Need the fresh menace to which the report relates, in the shape of new compound fertilisers made at the synthetic nitrogen works, be a menace at all, if courageous action is taken by by-product ammonia manufacturers? It is suggested that any compound fertiliser which is capable of being made by the synthetic nitrogen works is equally capable of being manufactured at by-product ammonia works. There is no mystery attaching to the manufacture of the proposed new compound fertilisers. Anyone, it is suggested, who appreciates what is involved in the production of pure ammonia from by-product ammonia, who has knowledge of the chemistry of soluble phosphate compounds, and who has a practical acquaintance with the technique of the Ostwald process, will not hesitate to concur in this view. A cheaper acid radicle than sulphuric acid has, we are assured, been found. It is available for at least several of the centrally situated works, and it is known that those responsible for winning this raw material are only too anxious to co-operate with the by-product ammonia industry. Neither gasworks nor coke ovens are likely to remain indifferent to the new situation. If the recovery of ammonia has to be made a charge against the operations of gas production or metallurgical coke manufacture, it is important that such charge should be reduced to a minimum. But need it be a charge at all?

The answer to this question depends on the readiness with which both the last-named industries adapt themselves to the changed conditions. Any delay in the provision of the necessary capital to admit of the re-modelling of the plant and process would be serious. Quite rightly does the Federation report refer to alterations in the present methods of ammonia recovery being necessary. Something of this nature has long been foreseen, and it cannot be doubted that investigations have been proceeding for some time. Although difficulties may be encountered, it is safe

to assume that they will be courageously met and overcome. It is hardly conceivable that a hitherto virile industry will succumb without a strenuous and intelligently-directed struggle.

"Imperial Chemical Industries"

We are officially informed that the registration of Imperial Chemical Industries, Ltd., was formally completed on Saturday, December 4. The company has been registered with an authorised capital of £65,000,000. As already announced, if all the shareholders of the merging companies exchange their shares for shares in the new company the issued capital will be £56,802,996. The objects of the company include acquiring or holding shares in Brunner Mond and Co., Ltd., Nobel Industries, Ltd., the United Alkali Co., Ltd., and the British Dyestuffs Corporation, Ltd. The first directors of the company will be the Rt. Hon. Sir Alfred Mond, Bart., M.P. (chairman), Sir Harry McGowan, K.B.E. (President and Deputy Chairman), the Rt. Hon. Lord Ashfield, P.C., Sir John Brunner, Bart., Mr. G. C. Clayton, C.B.E., M.P., Mr. H. J. Mitchell, Mr. Henry Mond, Sir Max Muspratt, Bart., Mr. J. G. Nicholson, Lt.-Col. G. P. Pollitt, D.S.O., the Most Hon. the Marquess of Reading, P.C., etc., Sir Josiah Stamp, G.B.E., and Mr. B. E. Todhunter. The company has the biggest initial capital of any company hitherto registered in this country.

The important effects that this amalgamation promises to produce in consolidating the British chemical industry have already been generally indicated. If any further evidence is required it is to be found in an admirably clear and comprehensive statement by Sir Alfred Mond, in which he declares that an overpowering influence upon the chemical markets of the world is assured by this vast scheme. The process of combination on a large scale has become so common abroad that the only policy for British industry is to meet strength with strength, combination with combination, and by amalgamation of forces to secure a powerful union against competition, whatever quarter it may come from. In one passage Sir Alfred sums up the advantages: "The merging of interests manufacturing similar products or utilising each other's products means economy in administrative, commercial, and technical directions. It means economy in overhead charges, in sales organisations, in purchases. It does away with unnecessary duplication of capital expenditure, and enables the reduction of costs by the interchange of technical knowledge and the promotion of intensified research. When different companies produce the same articles or are customers of each other's products, mutual assistance and production and mutual benefit in inter-company trade are bound to follow. Concerted control means proficient production and increased profits."

The formation of "Imperial Chemical Industries" may confidently be expected to produce at once all these advantages in the heavy chemical, fertiliser, and dyestuff branches of the industry, and it is reasonable to expect that other fields will presently be included. Two suggest themselves already. The first is the field of fine chemicals and drugs, including natural and synthetic therapeutic products. The other is the even larger field opened up by the application of intensive chemical research to coal, with a view to the production by synthetic methods of alcohols, acids, ethers and esters, aldehydes and ketones, hydrocarbons and cyclic compounds. The employment of high pressures and temperatures is now rapidly passing from exceptional to normal practice, and in this matter the new combine already possesses an efficient equipment. Even the beginning of such an amalgamation is a big event. Sir Alfred Mond is using words in no loose sense when he describes the future possibilities as "illimitable."

"Nitram Limited"

Official notices have now been issued respecting the transfer to the newly formed company "Nitram Ltd." of the selling and propaganda functions formerly undertaken direct by the British Sulphate of Ammonia Federation. The new arrangement operates as from November 30, and the address of the new company is Victoria Station House, London, S.W.1. "Nitram Ltd.," as already intimated, will be the sole selling and propaganda agents for all the sulphate of ammonia produced, owned, or controlled by members of or sellers to the Federation, and the company has undertaken to make no profit on the sale of such sulphate, as from the close of business on November 30 all sale contracts for sulphate will be made in the name of the new company, and from the same date the company will be prepared to take over all outstanding sale contracts entered into by the Federation and to be responsible for collecting all moneys due to the Federation. All moneys due to the Federation at the close of business on November 30 should be paid to the Federation.

In a circular issued by "Nitram Ltd." the additional information is given that the new company will be the selling agent not only for sulphate but "for all the products required for agricultural purposes which are or will be made by Synthetic Ammonia and Nitrates, Ltd.," and will also "as occasion requires act as general dealers in fertilisers of all kinds." This would empower the selling agency to deal in other than British fertilisers if it thought fit, but the much more probable line of development would seem to be the production of new British fertilisers by synthetic methods. Exactly what progress has been made in this direction is not generally known, but there have been rumours of very satisfactory progress in connection with ammonium nitrate and even with urea. The whole of the Federation propaganda staff is being taken over.

The New Chemical Fertiliser

The English daily journals, which keep us so well informed of every chemical advance in Germany, have been giving attention this week to the latest product of the I.G., which is described as "an ideal artificial fertiliser containing, in combination, all the three essential plant foods, namely, nitrogen, phosphoric acid, and potash." The new substance, which is called "Nitrophoska," is said to contain over 50 per cent. of pure nutriment for plants, whereas, according to statements made on behalf of the I.G., American farmers must use annually 5,000,000 tons of "complete fertilisers" in order to return to the soil 600,000 to

700,000 tons of its fructifying elements; or, to put it in another way, six sacks of "nitrophoska" will do the same fertilising work as five sacks of sulphate of ammonia, four sacks of superphosphate, and three sacks of 40 per cent. potash salts. It must be confessed that the "way" in which the merits of the new product is put is sufficiently alluring.

In the usually well-informed columns of the *Chemiker-Zeitung* we find a less picturesque, but more exact, account of the product. "Nitrophoska"—which, by the way, was put on the market on December 1—is prepared in two qualities. "Nitrophoska I," for heavy soils, contains 17 per cent. nitrogen, 11·7 per cent. water-soluble phosphoric acid, and at least 21 per cent. potash. "Nitrophoska II," for lighter soils, contains 14·7 per cent. nitrogen, 10·2 per cent. phosphoric acid, and 26·6 per cent. potash. The new "complete" fertiliser, as it is called, is being manufactured at Wolfen, the initial substance being potassium chloride, which is converted to nitrate. The output is 10,000 tons per month.

Chemical Conferences

TIME was when chemists met twice monthly in order to listen to the reading and discussion of a few papers. Now the fashion has changed, and they seem to meet twice nightly. The increasing specialisation to which the immense variety of modern chemical industry has given rise, has necessarily resulted in the formation of a large number of specialised groups and societies. Furthermore, instead of a programme of a varied kind, there is a tendency to institute conferences for the discussion of different aspects of a single subject. There is no doubt that these conferences are of great value, and the growing habit of interchanging technical information resulting is to be welcomed. They do, however, need some expenditure of time, and although this is well worth while to those who can afford it, it is a serious obstacle to the attendance of others. It cannot be too strongly urged that an employer who releases his chemists in order that they may attend is himself a gainer by doing so; but, especially as some of these conferences extend over more than one day, it is essential that their number should be kept down to a minimum.

In the last fortnight three conferences have taken place. The Tar Conference, in addition to giving rise to a number of illuminating discussions on various topics, also showed that in regard to research on low-temperature carbonisation, an admirable programme of investigation has been laid down. It is essentially scientific, in the sense that it is aimed at producing results of fundamental importance rather than at superficial and worthless brilliance. At the autumn meeting of the Institution of Fuel Technology other aspects of fuel research and allied developments were indicated. Particular attention may be drawn to Sir Richard Redmayne's paper on the production and treatment of brown coal (lignite) in Germany. Sir Alfred Mond's announcement that the fusion of the two existing fuel institutions is probable is very welcome, and indicates a step in the right direction. At the conference of the Institution of Chemical Engineers a whole day was devoted to the discussion of the application of statistical methods in the industry. There is room for much development in this aspect of works management, and the Institution has done an important service in concentrating attention upon it.

Books Received

FERTILISERS, THEIR SOURCES, MANUFACTURE AND USES. By Herbert Cave. London: Sir Isaac Pitman and Sons, Ltd. Pp. 116. 3s. 6d.

THE SOUTH AMERICAN HANDBOOK, 1927. Edited by J. A. Hunter. London: South American Publications, Ltd. Pp. 706. 2s. 6d.

CATALYSIS IN THEORY AND PRACTICE. By Eric K. Rideal and Hugh S. Taylor. London: Macmillan and Co., Ltd. Pp. 516. 20s.

The Calendar

Dec.		
13	Imperial College of Science and Technology: Annual Dinner. 7.30 p.m.	Hotel Cecil, London.
13	Ceramic Society. 7.30 p.m.	Central School of Science and Technology, Stoke-on-Trent.
13	Institute of Metals (Scottish Section): "Protection Coating of Metals"—"Fescolising." C. H. Faris. "Calorising," N. C. Marples. "Chromium Plating," E. A. Ollard. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
14	Hull Chemical and Engineering Society: "Coal Tar Dyes with Reference to some of their Chemical Engineering Problems." H. E. F. Pracy. 7.45 p.m.	Grey Street, Park Street, Hull.
14	Institution of Petroleum Technologists: General Meeting. 5.30 p.m.	House of the Royal Society of Arts, John Street, Adelphi, London.
14	Royal Photographic Society: Scientific and Technical Group. 7 p.m.	35, Russell Square, London.
14	Society of Glass Technology. 2.30 p.m.	University College, London.
15	Electroplaters' and Depositors' Technical Society: "Acidity of Certain Plating Solutions." A. W. Hothersall. 8.15 p.m.	Northampton Polytechnic Institute, St. John Street, Clerkenwell, London.
15	Society of Chemical Industry (Glasgow Section): "Some Technical Aspects of the Fuel Problem." E. W. Smith. 7 p.m.	39, Elmbank Crescent, Glasgow.
15	Royal Society of Arts: "Some Aspects of the Chemical Industry." William J. U. Woolcock. 8 p.m.	John Street, Adelphi, London, W.C.2.
15	Institute of Chemistry (Belfast Section): "Chemistry as a Factor in Education." J. C. A. Brierley.	Chemistry Dept., Queen's University, Belfast.
16	Society of Dyers and Colourists: "Organisation and the Dyeing Industry." W. Leach.	Bradford.
16	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London.
16	Staffordshire Iron and Steel Institute, Birmingham Metallurgical Society, and Birmingham Section of the Institute of Metals: "Hardening." Dr. Walter Rosenhain. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
17	Institution of the Rubber Industry (Edinburgh Section): "Modern Methods in Rubber Factories." C. Macbeth.	Edinburgh.
17	Society of Chemical Industry (Birmingham and Midland Section): Joint meeting with the Chemical Engineering Group: "Measurement of Temperature in Technical Practice." Professor J. W. Hinchley. 7.15 p.m.	University, Birmingham.
17	Society of Dyers and Colourists (Manchester Section): Joint meeting with the Manchester Section of the Institution of the Rubber Industry: "Cloth Dyeing Suitable for Rubber Proofing." H. L. Hockney and C. W. Bancroft. 7 p.m.	36, George Street, Manchester.

Intensive Production of Sulphuric Acid

By P. Parrish, A.I.C., M.I.Chem.E.

In the following article the author presents a survey of several systems and indicates the importance of the "liquid phase" and the application of the Gaillard turbo-disperser to all types of chamber, irrespective of shape or dimensions.

ELSEWHERE the author has suggested that the life of the chamber process is not seriously menaced, and that its usefulness is likely to remain unimpaired for some time. Formerly all the reacting substances entering a chamber set were in the gaseous phase, and the space-time factor was high—usually 20 cubic feet of chamber space per lb. of sulphur per 24 hours. But the cost of the erection of sulphuric acid chambers was appreciably less than it is to-day. Twenty-seven or twenty-eight years ago chemical sheet lead was delivered to chemical works at the price of £14 per ton, and for another £1 per ton the lead could be erected almost in any form desired. Moreover, if fresh chemical sheet lead were required, it was only necessary to re-pig the scrap lead and load to truck, and for another £2 10s. per ton an equivalent weight of new sheet was supplied.

What is the situation to-day? In respect of each of the foregoing items there has been at least a 300 per cent. advance. Small wonder, therefore, that of recent years a perennial problem of the sulphuric acid manufacturer has been the one of intensive production. Attempts to produce sulphuric acid intensively in the past have too often led to something in the nature of intensive costs, due either to deficient production, or to increased costs in the matter of nitrate of soda or nitric acid, and repairs and maintenance.

Effect of Cooling the Walls

It cannot be doubted that some progress has been made. The Mills-Packard plant is an example. By cooling the lead walls of the chamber externally, it has been possible to reduce the space-time factor (in other words, to increase the productivity of the plant) very appreciably without materially increasing the normal action on the lead.

That air-cooling, which was tried in connection with special forms of rectangular and circular chambers, prior to water-cooling, was not nearly so successful is generally conceded. But air-cooling, combined with the Benker and Millberg twin system, has found favour at several English works, and at a large number of continental ones. This system has a peculiar merit in that it contributes to the life of the lead. The temperature of the first two chambers, which are operated in parallel, is invariably 12° C. lower than that of the first chamber of a set where all the chambers are worked in series. This reduction of temperature is not without its influence in affording an added lease of life to the lead.

Another recent English development provides for a division of the chambers and for an increasing number of connections. There is no doubt that a periodic increase in the velocity of the gases, as is achieved by the adoption of a number of connections, provided in conjunction with shorter chambers, promotes a desirable turbulence, and augments the productivity of a unit in a really remarkable way.

But the thorough mixing of the gases and the effective dissipation of the heat of reaction are only two of the several factors influencing a solution of the space-time problem. They are undoubtedly important, but not nearly so important as what may be termed the "liquid phase"—a fundamental feature contemplated by the Metro bubbler tank, the Schmiedel roller box, or the Gaillard process (Patent No. 180,546). All these last-named processes are designed to effect rapid conversion of sulphur dioxide contained in the gases undergoing treatment into sulphuric acid. It has been suggested, in connection with the foregoing processes, that what should be decided was whether the burner gases should be forced through nitrous vitriol, or whether the nitrous vitriol should be atomised in profuse quantity and brought into contact with the burner gases. Evidence is rapidly accumulating that mechanical means for producing an acid mist will outlive those which have for their object the forcing of the burner gases through a light seal of nitrous acid. The number of plants of the Gaillard type which are being erected is very considerable.

From inquiries which have been made, it is elicited that no fewer than 150 turbo-dispersers are in operation to-day on different types of chambers, etc. This is unmistakable evidence of the growing appreciation of the importance of the liquid phase *as the important factor* in sulphuric acid production. Apart from the significance of the liquid phase *per se*, it is obvious that one cannot introduce to a sulphuric acid chamber profuse quantities of acid in the form of a mist without such acid absorbing the heat of reaction. In connection with all the turbo-dispersers of the Gaillard type which are installed in conjunction with chamber units, provision is made to cool the acid discharged from the chamber prior to recirculation.

A further aspect of importance, where the Gaillard turbo-dispersers are employed, is that water sprays can be dispensed with. Any water that may be required to aid the reactions can be introduced with the acid being atomised. It should be noted that the water employed should be free from chlorides, otherwise hydrochloric acid will be formed, which cannot but be injurious to the lead. Where it is proposed to erect new chambers, it is preferable that they should be cylindrical in shape, not exceeding 7 metres diameter, and that uni-flow of the gases and the atomised acid should be arranged.

While it is granted that the larger the diameter of a reaction tower chamber, the less the cost of construction in the matter of lead per unit of capacity, it has been demonstrated by M. Gaillard that the intensity of production of acid per cubic foot is less with a large tower than with a small one. The conclusion has been reached that 7 metres diameter is the optimum with the present type of disperser. When the diameter is too large the irrigation is imperfect, and there are zones which are only imperfectly fed with acid. Thus the intensity of the reaction is less at these points. Irrespective of the liquid phase, M. Gaillard stresses the importance of the wetted surface of the lead walls as an important factor contributing to intensive production.

A typical modern Gaillard plant is shown in Fig. 1, which represents a unit which was installed a short time ago at la Telguera (Oviedo) works of la Sociedad Ibérica del Nitrogeno.

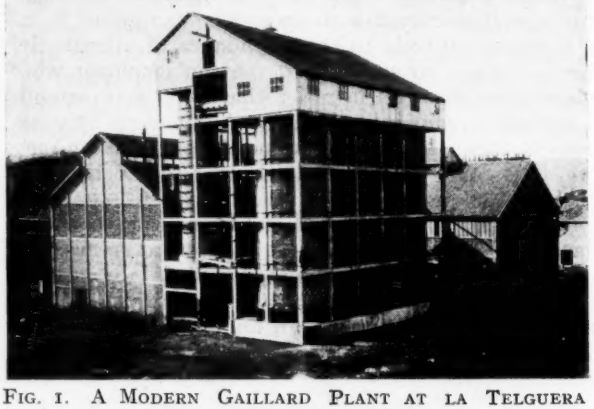

FIG. 1. A MODERN GAILLARD PLANT AT LA TELGUERA (OVIEDO)

This plant comprises: three mechanical burners, each capable of burning 9 tons of pyrites, 48 per cent. sulphur, per 24 hours; one void Glover tower, 3 m. 90 internal diameter and 19 m. high; three tower chambers 6 m. diameter and 18 m. high; one void Gay Lussac tower, 3 m. 80 diameter by 17 m. high; and one final Gay Lussac tower, packed with rings, 3 m. 80 diameter by 17 m. high. A fan operates between the first and second Gay Lussac towers. Turbo-dispersers are provided for the Glover and void Gay Lussac towers, as well as for the three tower chambers. Although the production of this plant, when designed, was regarded as 30,000 kgs. of acid of 53° Bé. per 24 hours, this make has been exceeded very considerably.

But it must not be imagined that the efficient application

of the Gaillard turbo-disperser is confined to cylindrical tower chambers. It has been applied in the case of a large number of sulphuric acid plants to the old rectangular type of chamber, and the results have been striking.

Of course, height, in so far as rectangular chambers are concerned, has an important influence. Obviously, the higher the chamber the greater the productivity of acid under liquid phase conditions. But the adoption of the turbo-disperser in connection with the old type of chamber plant adds to the flexibility of the unit very appreciably, and provided continuous records of the working temperatures are kept, and the discharged acid from the chambers is cooled, it can safely be said that an increased production of 50 per cent. can be secured without any appreciable increase in the nitric acid consumption, without any extra deterioration of the lead, and with greater regularity of operation.

Fig. 2 (*a*) shows the method of fixing of a Gaillard turbo-disperser to an old type of rectangular chamber, and 2 (*b*) the disposition of the dispersers in connection with a complete plant.

The cost of the equipment of an old plant so as to operate intensively is very small, and the increased cost of working does not represent more than 2d. per ton of acid produced. That the conversion can be effected inexpensively, with facility, and without any cessation of the operation of the plant need hardly be emphasised, as it is made abundantly clear in Figs. 2 (a) & (b).

It has been demonstrated that a greater production than 15 kilograms of 53° Bé. acid per cubic metre can be obtained, with a nitric acid consumption ranging between 0·8 and 1·0 kilogram of 36° Bé. nitric acid per 100 kilograms of 53° Bé. acid produced. The above figures represent less than 4·8 cubic feet of chamber space per lb. of sulphur per 24 hours, and a nitric acid consumption ranging between 2·6 and 3·25 lb., expressed as nitrate of soda per 100 parts of sulphur.

There are far more Gaillard dispersers working in conjunction with rectangular chambers to-day than in connection with new tower chambers. On every hand there has been a unanimity of opinion that with a rain of finely atomised acid which the disperser in question alone ensures, not only is there an important increase in the production of acid, but what is almost equally important, there is a greater regularity in the operation of the plant. It is wrong to assume that the projection of acid on the walls of the chamber necessarily results in erosion or abrasion.

A Danish works has had turbo-dispersers in operation now for 19 months, and they affirm that up to now no extra deterioration of the lead is noticeable. Indeed, a uniform flow of acid down the walls of the chamber, such as is ensured by the operation of the Gaillard disperser, must militate against pitting such as is normally experienced in connection with the old rectangular chamber.

It is a common experience to find that with chambers of the last-named type, after they have been in operation for four or five years, despite all efforts to ensure the absence of any direct contact between the lead and the supporting wooden framework, invariably the lead which is in close

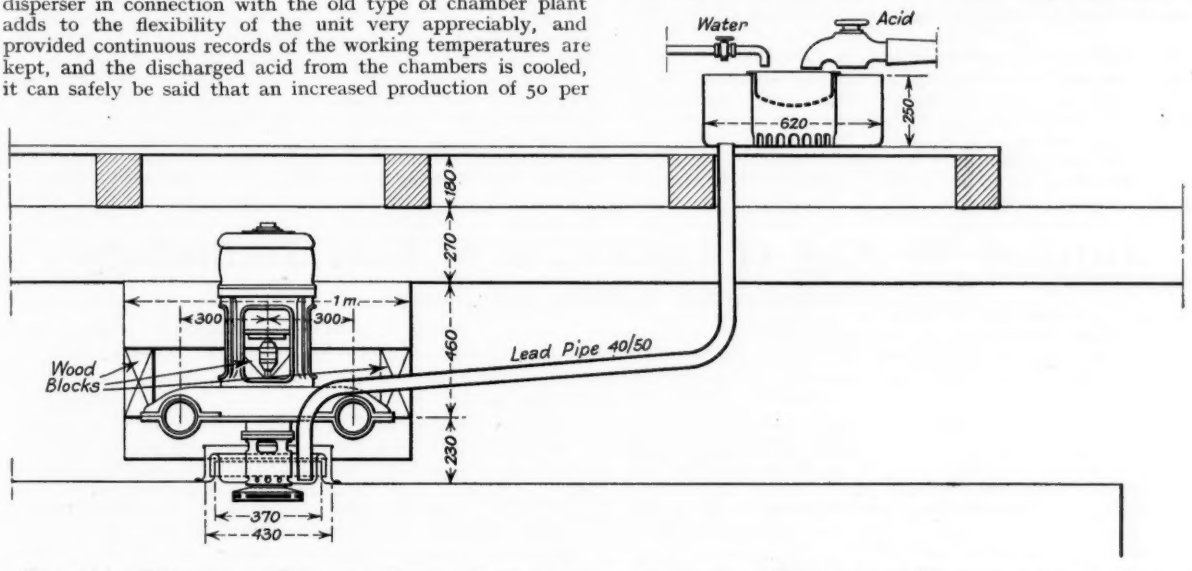

FIG. 2 (*a*). FIXING OF A GAILLARD TURBO-DISPERSER TO AN OLD TYPE OF RECTANGULAR SULPHURIC ACID CHAMBER.

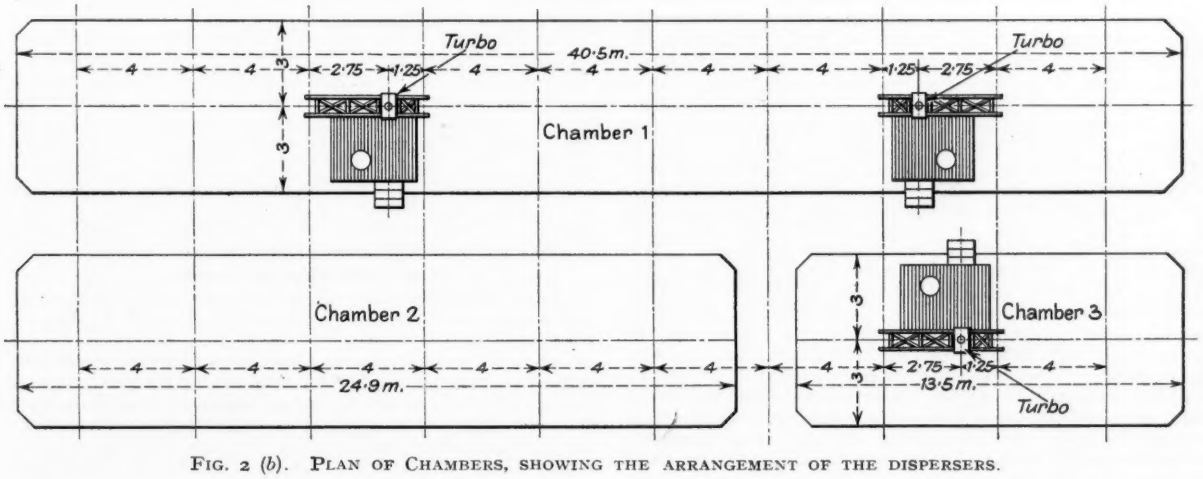

FIG. 2 (*b*). PLAN OF CHAMBERS, SHOWING THE ARRANGEMENT OF THE DISPERSERS.

proximity to the vertical members is pitted almost throughout its length, whereas the lead intervening the uprights is almost uniformly free from "pits." Indeed, it has, almost invariably, a smooth surface. The cooling influence of the constant trickle of acid down the walls of the chamber cannot but be advantageous.

The turbo-disperser system can be applied to all types of rectangular chambers, whether high or low, although a high chamber necessarily affords a better opportunity for the atomised acid to exert its beneficial influence than a low one.

The flexibility of operation lies in the fact that either 78 per cent. acid or nitrous acid of varying nitrosities can be used at will, according to the condition of the chambers in respect of oxides of nitrogen, which is revealed by continuous temperature and density records. Immediately there is a tendency for the production of acid to become sluggish, a feed of nitrous acid of given nitrosity can be supplied to the disperser until normal conditions are restored. The advantage of this ready application of a restorative influence cannot be over-estimated.

Another feature of importance has been remarked upon by the manager of a works employing zinc blende as the sulphur material. With the operation of a turbo-disperser in the last chamber, the atomised acid accumulates each time an increasing quantity of N_2O_3. By reason of this fact, and in consequence of the peculiarly intimate contact between the nitrous acid atomised and the last traces of SO_2, instantaneous oxidation ensues, and there is a regularity of operation hitherto unknown, with an accompanying economy of nitric acid.

When the sulphuric acid industry of this country emerges from its present depression (and there are already hopeful signs abroad), it cannot do better than examine carefully a system which has received nothing but encomiums on the Continent, and which can be applied with advantage and profit to many installations in this country.

Autumn Meeting of Institution of Fuel Technology

Presidential Address and Papers

The Autumn Meeting of the Institution of Fuel Technology was held on Tuesday and Wednesday, at the Institution of Mechanical Engineers, Westminster, London. The presidential address was delivered by Sir Alfred Mond, and a number of papers were read and discussed. On Tuesday evening, the president held a reception at the Hotel Cecil, which was followed by the inaugural dinner.

THE proceedings at the meeting of the Institution of Fuel Technology opened with the presidential address, delivered by Sir Alfred Mond. He said that the main problems of fuel technology as they existed might be considered under three main heads:—(1) Fuel economy to be obtained from existing plants now in actual operation; (2) Fuel economy resulting from the development of electricity; (3) The future development of fuels, such as new uses and treatments of coal, oil, and the elements. The distillation of coal had always been an attractive subject. Every day there were destroyed, in direct combustion of fuel, by-products which, could they be recovered economically, would not only find valuable uses but by economising fuel would eventually cause more to be burnt by a general and really economic increase of trade. One of the main fuel economies which would be effected in the not very distant future would be by a solution of the oil from coal problem. Big strides had been made since the war in the direction of extracting by commercially profitable processes various necessary oils from coal. The submarine menace, threatening as it did to cut us off from American oil supplies, gave a great stimulus to research towards this end. Our success, though not complete, was decidedly gratifying. By a solution of the oil from coal problem a large portion of the surplus coal production in Britain would find legitimate use in supplying the ever-increasing demand for fuel oils, and would render countries like our own immune in time of war from the necessity of importation of one of the most vital essentials for army, navy, and Air Force. He was confident that if research and development were carried out in the right spirit and on the right lines, Britain in a few years would have made great strides towards a position of being self-supporting as regards oil fuel supplies, because she would be able to draw those supplies at a cheaper rate and with expedition from her own vast coal supplies.

A Step Towards Unity

The almost simultaneous foundation of two institutions to deal with the questions of fuel economy and technology proved that the urgent and imperative necessity of those problems to the future of British industrial and commercial life had now been forcefully recognised. He had the honour to be president of both the Institution of Fuel Economy Engineers and the Institution of Fuel Technology. For some months it had been increasingly felt, both by those who were most closely associated with problems of fuel economy, and by those throughout the country who had a general interest in the question, that the two institutions should be merged into one body. After various preliminary discussions as to the conditions of fusion, he had taken it upon himself to suggest various concrete proposals. They had included the suggestion that a new title for the combined institution should be adopted by a joint council of the two existing institutions; that the membership of the new institution should consist of four classes, including a class of Fellows, to be limited at the discretion of the new council to be appointed; and that the new council should, in the first instance, be determined by a joint meeting of the president, vice-presidents, and chairmen of both institutions.

These proposals had been accepted in principle by the councils of the two existing institutions. The whole problem was approached in a spirit of good will, and it now only awaited formal ratification to be given to the formation, upon a mutually satisfactory basis, of one great and powerful united organisation.

The first paper at the meeting, dealing with "Some Phases of Modern Practice in Gas Manufacture," was read by Mr. T. Hardie, M.Inst.C.E. Mr. Hardie pointed out that the process of coal carbonisation for the manufacture of gas reached the high thermal efficiency of 78·4 per cent. Improvements which could and had been made were discussed, under the following headings: Heating of the Retorts; Horizontal Retorts; Vertical Retorts, Continuous Carbonisation; Carburetted Water Gas; and Steam Requirements of Gasworks. The paper closed with an account of the application of waste heat recovery by the Gas Light and Coke Co.

The Combustion of Carbon

Professor R. T. Haslam, of the University of Massachusetts, read a paper on "The Combustion of Solid Fuel." This paper dealt with the reaction $C+O_2=CO_2$, and summarised and discussed the information in the literature on the mechanism of the reaction and the factors determining its rate. It was pointed out that during the past 50 years a number of theories had been advanced to explain the combustion of solid carbon, the principal ones being (*a*) that CO_2 was the first product formed when carbon burned in air (*b*), that CO was the initial product, and (*c*) that a physico-chemical complex of carbon and oxygen having the formula CxOy was first formed, this in turn breaking down to give CO_2, or as Rhead and Wheeler believed, both CO_2 and CO. The evidence showed that the first two theories could not be accepted as correct. The work of Langmuir, Weyman, and others supported the view that the mechanism of the combustion of solid carbon at furnace temperatures began with the formation of a physico-chemical complex CxOy.

At the beginning of Wednesday's session "The Occurrence, Working, and Treatment of Brown Coals, with Special Reference to German Practice" was treated in a long paper, illustrated with many valuable photographs and diagrams, by Sir Richard Redmayne. He stated that owing, probably, to the concentration of interest upon the higher grade or true coals of the carboniferous formation and—occasionally—of the mesozoic division, the technical literature relative to the working and treatment of lower grade immature coals of the Tertiary division—the lignites or brown coals, as they were

alternatively named—was meagre, scattered, and indefinite. In view of the vast deposits of lignite which were contained within the British Empire, and the commercial possibilities which existed in connection with their exploitation, some account of the working and treatment of these comparatively low-grade fuels might be considered opportune, though, as far as the British Isles themselves were concerned, the deposits of brown coal were insignificant. In Germany, brown coal was largely used in industries requiring cheap fuel, as for example in great electrical power stations. The Leuna works, which had the largest nitrogen fixation plant in the world for the production of sulphate of ammonia, had been erected in close connection with several brown coal mines in Central Germany, the daily consumption of fuel at the works being 3,000 tons. In order to permit of long-distance transport it was necessary to raise the calorific value of brown coal by drying it and compressing it into briquettes. The briquetting of brown coal was also carried out in Victoria, Australia. Brown coal was also used in Germany for the production of the valuable "moutan wax," which was extracted from the coal by means of a benzol-alcohol mixture. This wax had a large number of applications, and was very valuable. Furthermore, there was an old established and flourishing low-temperature carbonisation industry in Germany, as applied to brown coal.

Design of Industrial Furnaces

At the request of the Council of the Institution of Fuel Technology, Professor Grcum-Grjimailo, of the Petrograd Polytechnic, submitted some notes and illustrations descriptive of his most recent achievement in the design and construction of industrial furnaces, in the form of a paper on "The Hydraulic Theory of the Flow of Gas in Furnaces." Professor Groum-Grjimailo's work is not very well known in this country, and the new material was prefaced by an introduction containing a summary of the theories set forth in the "Essai d'une théorie des fours a flammes," which forms the basis of this work. The writing of the introduction and the arrangement of the new material was undertaken by Dr. M. W. Travers, F.R.S. The diagrams accompanying this communication formed a special feature.

Mr. S. McEwen dealt with "The Carbonisation of Bituminous Coals at Low Temperature." The subject was treated under the following headings: High-temperature Carbonisation; Solid Residue of Low-temperature Carbonisation; Market Value of Low-Temperature Tar Oils; Characteristics of Low-temperature Tar; Motor Fuel; Technical Considerations of Carbonisation at Low Temperature; Heat Transmission; Carbonising Pulverised Coal; Prospective Relations of Low-temperature Carbonisation to Existing Methods of Carbonisation; Combination of Carbonising Industries; and Low-temperature Carbonisation and Hydrogenation. Mr. McEwen discussed, among other things, Dr. Muller's work at the Karnap Colliery, Essen, and that of Dr. Runge on the carbo-coal process in Virginia. He also touched on his own experiences in the carbonisation of pulverised coal.

Air Pollution

The last paper read at the meeting was a communication on "Smoke and Public Health," by Dr. J. S. Owens, of the Air Ministry's Advisory Committee on Atmospheric Pollution. Dr. Owens stated that the effect of smoke upon health could be considered under the following headings: the effect of breathing smoky air; the loss of daylight; and the loss of direct sunshine, and more particularly of the active ultra-violet rays. He dealt at length with the breathing of dust-laden air; loss of daylight; loss of sunshine; ultra-violet rays; and fogs. In a very striking graph, it was shown that a marked parallelism existed between the curves illustrating respectively the annual deposit of dust in London in tons per square mile, and the death rate.

The Chemical Engineers' Conference

Statistical Methods in Relation to Industrial Efficiency

On Wednesday, Thursday, and Friday the Institution of Chemical Engineers held a conference at the Science Museum, London. A number of papers were read and discussed, those contributed on Thursday being part of a symposium on "Statistical Methods in Relation to Industrial Efficiency."

THE conference opened on Wednesday afternoon with a paper on "The Measurement of Mechanical Power Absorbed by Driven Machines—A Recording Torsion Dynamometer," by R. G. Parker, B.Sc., F.I.C., and D. N. Jackman, M.Sc., A.I.C. The investigation arose out of the need for information as to the amount of power required to drive laundry machines, particularly washing machines. The instrument described—the Parker-Jackman dynamometer—was a transmission torsion dynamometer, which did not itself convey power, but which could be applied to a shaft conveying power. Such a shaft was slightly twisted, and the twist, which was proportional to the power, could be measured. The measurements were recorded by a camera on sensitised paper. Typical photographic records were shown.

Statistical Control of Plant Operations

Tuesday's proceedings were devoted to a symposium on "Statistical Methods in Relation to Industrial Efficiency," which was opened by Messrs. D. Rider, M.I.Chem.E., and T. C. Finlayson, M.Sc., A.M.I.Chem.E., with a paper on "The Control of Chemical Plant Operation by Statistical Methods." They pointed out that in many industries the margin between cost and receipts had become so small that the closest attention to output and efficiency was necessary in order to insure the payment of dividends. The paper was written from the point of view of the man in charge of the factory operations, the works manager or factory superintendent, and aimed to indicate the way in which the control of all the departments, comprising the factory, might be made quite simple and efficient by means of statistical methods. It dealt at considerable length with the subject, under various heads, such as the organisation of a statistical system; the production of daily figures; the shift foreman's report; plant manager's report; daily laboratory report; the traffic department report; and the engineer's daily report. Having these data before it, the statistical department would be in a position to prepare various statements, such as stock accounts and record books. For the works manager the department must prepare daily information as to production, labour, and costs. This involved the preparation of charts of daily production, labour and stock, etc., and also the calculation of process efficiency. The works manager also required weekly figures indicating process efficiency, production, stocks, process labour hours, and maintenance labour hours. The purchasing and sales departments respectively required records of raw and finished materials.

Forecasting Industrial Conditions

"Statistics in Industry: Some Uses and Limitations" was the subject dealt with by H. C. Marris, M.I.Chem.E. Industry, he said, could be divided into three sections—buying, manufacture, and selling. Efficient buying could be defined as selecting that moment for buying when the market was at its lowest and purchasing sufficient quantities to suffice until the upward trend was passed and the price was again at its lowest. Efficient selling might be regarded as selecting that moment when the market was highest and unloading the greatest amount of goods possible at that price. To be able to meet the conditions of these definitions one should be in a position to forecast what was about to happen in industry.

Trade forecasting might be divided into two kinds: the first, long term forecasts, were such as those applying to the exhaustion of natural resources like coal or food; while the second section might be considered as composed of (*a*) trade cycles and (*b*) short term forecasting affecting immediate requirements. Mr. Marris added that for purposes of trade at present the statistical help available was limited.

The last paper at the symposium on statistics was that of Mr. E. Cooke, on "Statistical Methods in connection with Plant Construction."

On Friday, Dr. G. Martin, M.I.Chem.E., read an account of "Researches on the Laws of Air Elutriation." He summarised

the results obtained as follows : when particles were very small Stokes's Law was obeyed, but with larger particles it broke down ; the influence of temperature on the size of particle supported was marked ; the phenomena of evaporation and distillation in liquids was simulated by powders.

Refrigeration and Chemical Manufacture

" Refrigeration in the Chemical Industry " was the title of a paper read by Mr. H. M. Dunkerley, A.C.G.I., which wound up the conference. The object of this paper was to set out the methods whereby the costs of refrigeration might be calculated so that those interested could see to what extent the use of refrigeration would pay them. Refrigeration frequently reduced process costs, and its use in chemical works was rapidly increasing. Refrigeration in the sense used here implied a reduction of temperature in a fluid or material to a figure lower than that which could be obtained by the application of water from the works' mains. In various chemical processes cold was often applied in a wasteful and extravagant manner, and the secondary object of the paper was to show the methods by which the costs might be kept as low as possible.

The construction of refrigerating plant was described in some detail, with illustrative diagrams. As regards cost, the cost of refrigeration was made up of the following items : —(1) Interest and depreciation on the capital expenditure on the plant ; (2) power costs ; (3) labour costs ; (4) stores costs, which included ammonia, oil, repairs, refitments, etc. From an analysis of a number of typical installations in chemical works it appeared that for a plant capable of extracting 2,000,000 B.ThU's per hour, and assuming that the average B.Th.U's per sq. ft. was 450, the capital cost of the refrigerating plant, buildings, land, etc., worked out at £11,000. As an approximate check on these figures, it could be taken that the capital cost of refrigeration installations in chemical works ranged from £70 per 10,000 B.Th.U's per hour for plants of 250,000 B.Th.U's per hour capacity down to £50 per 10,000 B.Th.U's per hour for those of two or three million B.Th.U's size.

Chemistry and Organic Evolution

The Trend of Modern Work

At a meeting of the Manchester Section of the Society of Chemical Industry held on Friday, December 3, Professor J. C. Drummond, professor of bio-chemistry at University College, London, read a paper entitled " Some Chemical Aspects of Organic Evolution." Mr. L. Guy Radcliffe presided.

Professor Drummond said that nowadays many people thought that the degradation of the hexose molecule by the cell, whether plant or animal, was the fundamental reaction of all living matter, and that it was carried out by a series of reactions which in their essential features were identical in all species. Attention was drawn in this direction a few years ago, when Embden advanced reasons for believing that prior to the breakdown of dextrose in muscular contraction there occurred a combination with phosphoric acid producing a hexosediphosphate of the type isolated by Harden and Young from fermenting mixtures, and shown by them to be an essential stage in the breakdown of sugar by yeast. The parallel had now been established by the proof of identity of the compounds isolated from muscle and from yeast fermentations, and had been extended to the case of carbohydrate metabolism in the respiration of green plants and germinating seeds.

Professor Meyerhof had emphasised that yeast during the ordinary fermentation process was living under what might be regarded as somewhat abnormal conditions. His work, and that of Mr. A. V. Hill, formerly professor of physiology at Manchester University, won for both of those gentlemen the coveted Nobel Prize. Their researches showed that the lactic acid which arose during muscular contraction was more than a mere product of one phase of the reaction, for it was part of the mechanism which played a part in the reaction. The lactic acid actually arose during the initial phase of the cycle of muscular activity, and this phase was anærobic. During the so-called recovery phase that followed some part of the lactic acid was rebuilt into its original precursors—hexosephosphate and glycogen—at the expense of the energy that was derived by the ærobic oxidation of the remainder. The proportion of molecules oxidised to those used for synthesis was approximately 5 to 1.

Chemistry as a Career

Professor A. R. Ling's Address at Birmingham

At the annual general meeting of the Birmingham Section of the Institute of Chemistry, held on Wednesday, November 24, Professor A. R. Ling, of the University Department of the Biochemistry of Fermentation, delivered an address on " Chemistry as a Career."

Professor Ling pointed out that although chemistry was probably one of the oldest branches of science, it was one of the youngest professions. He went on to outline the growth of the professional feeling in the science as exemplified by the foundation of the Chemical Society of London and the Institute of Chemistry, and to show what had since been done to improve the status of the chemist in various ways.

The Education of a Chemist

The applications of chemistry were very wide, and there should be plenty of scope for young chemists to obtain employment if they were trained in such a manner as to fit them for the positions awaiting them. It was necessary that the student before entering the university or college should have received a sound education in the ordinary elementary subjects. The chemistry student might take up as his career pure science in which he would devote himself specially to academic studies, or he might take up one of the numerous branches of applied chemistry. But in whatever branch he adopted he must have a sound training in pure chemistry, physics, and mathematics. In the University of Birmingham a student who entered his studies with a definite object, say to become a biochemist, was required after passing the matriculation examination, to take chemistry as principal subject, with physics and some other branch of science as subsidiary subjects.

The chemist attached to modern industries required not only a sound knowledge of chemistry, physics, and mathematics, but also some acquaintance with engineering. For some years it had been the fashion to plead for the training of a specialist who had been termed a chemical engineer. Personally, he felt that to devote more than a very limited portion of his training to engineering might prove waste of time to the chemist. He should undoubtedly be acquainted with the principles of steam raising and generally be able to appreciate the difference between work in the factory and in the laboratory, but he believed that beyond those he would readily acquire that special engineering knowledge which was needful to him in the factory itself. The aim of the industrial chemist should be to free himself as soon as possible from the trammels of routine analysis and to prove his value to his employer as a research worker, with the ultimate object of becoming a works manager.

Careers Open to Chemists

Among the careers open to chemists most of those of which he could claim a knowledge were concerned with some branch of organic chemistry. His knowledge was confined to biochemical processes, more especially those connected with food and drugs, sugar, fermentation, general plant biochemistry, and bacteriology. The importance of the study of food and drugs was such that it offered an ever increasing number of positions both here and in various parts of the Empire to young chemists who had received the necessary training. Among those positions might be mentioned those of the public analyst, the agricultural chemist, and the manufacture of different foods and pharmaceutical products. The sugar industry, which was now well established in this country, offered positions for routine chemists which formed a stepping stone to the positions concerned with research and factory control and management.

In conclusion, Professor Ling pointed out that the profession of chemistry demanded a high-class general education, and that could not be too strongly brought to the notice of parents who wished their sons to enter it as a career. Such elementary training should include one at least foreign language, preferably German, whilst a knowledge of Latin would help the student to write and think clearly. The study of scientific subjects was, in his opinion, not so necessary during the period the student was at school, and was best left to university teachers. On entering the university the chemical student should not attempt to specialise, but he should spend his time up to the pass degree stage almost entirely in the study of pure science. He would then have a sufficient insight into the science to be able to judge which line he intended to choose for his career.

Work of the Russian Chemical Society

Ignorance of British Chemistry

PARTS 1-6 of Vol. 58 of the *Journal of the Russian Physico-Ghemical Society* and parts 1-5 of Vol. 32 of the *Proceedings*, which contain abstracts of papers, communicated, but so far not published in the *Journal*, witness much activity in Russian chemical circles, and this activity is also evident from the general position of the Russian Chemical Society, which has grown during 1925 from a membership of 306 to that of 380. Although such a membership seems to be small if compared with those of other chemical societies, it must be remembered that Russian chemistry disappeared entirely for all practical purposes during the revolution, and that the disintegration of Russia into a number of small states has led to the formation of many other chemical bodies.

The monographs embodied in the journal are headed by the general title "Communications of the Fourth Mendelejeff Congress," which met at Moscow in 1925, and the issue of the *Journal* of 1926 will thus permanently be known by Mendelejeff's name. The sixty communications consist of 21 papers on organic, 8 on inorganic and analytical, and 3 on biological, while the remaining 28 papers deal with physical chemistry.

Of particular interest are a series of communications by M. N. Dojarenko on the rearrangement of cyclic into unsaturated chain compounds. They contain a great deal of experimental details which do credit to Dojarenko, considering that the whole research was done single-handed. Dojarenko suggests a general theoretical basis for these reactions which will scarcely be accepted, and would have probably not been suggested had he been acquainted with Robinson's theory of molecular rearrangement as extended by Ingold. There is, however, a remarkable ignorance of British chemistry in Russia, which can best be illustrated by the fact that the latest textbook on organic chemistry, written by a most eminent Russian organic chemist, contains only one reference to British chemistry, namely, to Perkin's synthesis of cinnamic acid, which appeared, however, in Liebig's *Annalen*, and not in an English journal!

Oil and Fat Industry

The new Russian Journal of the Oil and Fat Industry which appeared in August, 1924, and of which Parts VII and VIII have reached this office, is the official organ of the Soviet Oil and Fat Syndicate, and is published under the editorship of no less an authority than V. N. Ipatjeff. The copy to hand contains 22 original articles which are subdivided into sections dealing with the technical (15 papers), agricultural (2 papers), and economical (5 papers) aspects of the question. Abstracts and patents are also included.

The main objects of the journal are naturally industrial; some attention, however, is also given to the theoretical sides of the question which are only lightly dealt with. Of some interest to English readers are two papers which deal with the economical position of the industry in Russia (pp. 71-102) by F. Borisenko and A. Markman respectively. Both writers discuss the sunflower oil industry and throw some interesting light on the economic conditions in Russia. Borisenko writes in detail on the best oil-producing sunflowers, whereas Markman deals in a very interesting manner with the growth of the industry since 1914. Here it may be mentioned that the production of sunflower seeds in the Kuban district has grown from 18,000 puds in 1914 to 87,000 puds, according to data to hand, in 1923. This is a remarkable achievement due to careful selection of seeds as recommended by Borisenko and an extensive study of the soil. This latter point is illustrated by a map of the Kuban district, which co-ordinates the soil conditions with the production of sunflowers. The cost of the journal, which appears bi-monthly, is 12 roubles per annum. It is well printed and deserves attention.

I.C.I. Board Meeting

IMPERIAL Chemical Industries, Ltd., held its first board meeting on Wednesday, in London. Mr. John Rogers, the technical director of Nobel Industries, Ltd., was appointed a director of I.C.I. The directors of Nobel Industries, Ltd., have released Mr. W. H. Coates from his engagement as secretary to the company, following his appointment as treasurer to I.C.I. Mr. E. N. Wise, formerly assistant secretary, has been appointed secretary to Nobel Industries, Ltd.

Society of Public Analysts

Abstracts of Papers Read

AN ordinary meeting of the society was held at the Chemical Society's Rooms, Burlington House, London, on Wednesday, December 1, Mr. E. Richards Bolton, president, being in the chair. Certificates were read for the first time in favour of Messrs. S. Greenberg, F.I.C., F. C. Ray, M.A., F.I.C., and G. C. Matthews, B.Sc., A.I.C., and for the second time in favour of Mr. S. G. Burgess, B.Sc., A.I.C. The following were elected members of the society:—Miss G. G. Andrew, B.Sc., Messrs. C. E. Barrs, F.I.C., T. H. Barry, G. W. Douglas, B.Sc., C. V. Ferriss, B.Sc., A.I.C., and R. C. Pakes, B.Sc.

Bacteriology of Food and Water

"Recent Advances in the Bacteriological Examination of Food and Water," was the subject of a communication by Dr. W. G. Savage. He discussed the four tests used to differentiate the high and low types of coliform organisms in water and their value as indicators of excremental contamination. As regards milk, the value of examining centrifugalised deposits for the tubercle bacillus was considered, and new tests for distinguishing pathogenic streptococci from those of bovine origin not injurious to man were described. An outline was given of the types of bacteria causing food poisoning, together with details of laboratory methods, and the examination of canned foods was also dealt with.

Furfural in Vinegar

In a paper entitled "On the Presence and Detection of Furfural in Vinegar," Messrs. L. H. Lampitt, D.Sc., F.I.C., E. B. Hughes, M.Sc., F.I.C., and L. H. Trace, B.Sc., A.I.C., pointed out that in the distillation of malt vinegar or wine vinegar furfural was produced by the acid hydrolysis of the pentosans contained in the vinegar; this explained the presence of furfural in commercial distilled vinegar. Added caramel in vinegar would only give the furfural it originally contained as such. A modified aniline acetate test had been devised wherein the rose-coloured furfuraniline was extracted by an immiscible solvent, amyl alcohol. Thus dark-coloured vinegar might be tested for furfural without distillation. The test was satisfactorily quantitative.

Opium in Stomach Contents

Mr. E. R. Dovey, A.R.S.Sc., F.I.C., discussed "The Rapid Determination of Opium in Stomach Contents." A standard solution was made from ordinary prepared opium which had itself been standardised to contain 10 per cent. of morphine and 5 per cent. of meconic acid. A measured quantity of the stomach washings (which had given the reactions for morphine and meconic acid) were treated successively in a Nessler cylinder with dilute hydrochloric acid, mercuric chloride solution, and ferric chloride solution, and the resulting colour was matched with that given by the standard under the same conditions. The addition of the mercuric chloride inhibited the formation of any coloration with thiocyanic acid in the opium.

Rapid Sorting of Butters and Margarines

"A Rapid Method for the Sorting of Butters and Margarines" was outlined by Mr. C. H. Manley, M.A., F.I.C. The method depended upon the butyric acid content of butter fat. The filtered fat was saponified, the soap solution acidified with sulphuric acid, and the insoluble fatty acids filtered off under specific conditions. The excess of sulphuric acid in the filtrate was neutralised (methyl orange as indicator) and the titration with standard alkali continued to neutrality, with phenolphthalein as indicator. The difference between the result and that obtained in a blank test afforded a measure of the soluble fatty acids. The neutral solution could be used for determining the Kirschner value.

Paints which Indicate Temperatures

SOME very interesting products recently developed by the General Electric Co. of America are paints which undergo change of colour on heating, reverting to their original shade on cooling. In these paints various chemical compounds which undergo colour changes on heating may be used; for example, the double copper-mercury or silver-mercury iodides. The former, bright red at ordinary temperatures, changes (through chocolate) to black at 100° C. These paints will obviously be very useful, in many ways, in chemical and engineering practice. They might be used on bearings to indicate overheating, for indicating levels of hot liquids, etc.

Castleford Dye Works Explosion

To the Editor of THE CHEMICAL AGE.

SIR,—We should be glad if you would correct the wrong impression that is likely to be made by the report of the fire and explosion that took place at our works on the 22nd ult. as given in two evening papers, and some of which is incorporated in the description in your issue of November 27.

We deeply deplore the loss of two lives and the injury to one other man, all the more so as one, Mr. Arthur Semper, was an old and exceptionally trusty servant, but the statement that windows were broken in 300 houses, that people in the streets were thrown to the ground, or that a hut had been hurled 50 yards away into the river, have not been supported by any evidence whatever and are great exaggerations and, except for some few windows, are untrue.

The picture which some enterprising photographer sent round generally is also most misleading. The roof shown, a light iron girder roof, is hardly damaged at all, but the fact that the asbestos sheet roofing—an extremely brittle material—collapsed, gives the appearance of a total wreck.

You and the rest of sympathisers who have written us and to whom through you we should like to convey our thanks will be glad to hear that the accident occurred in the extreme north-east corner of our works, covering 6¼ acres, a fairly long way from other plant, and no single unit was damaged so as to cause interruption of manufacture—not even the dinitrophenol plant which was within 6 yds. of the hydro extractor, where the explosion occurred, was damaged. Fortunately the whole force of the explosion went to the north-east direction which was open country without any building or plant on it, and the rest of the works escaped material damage. I remain, etc.,

ERNEST HICKSON,
Chairman and Managing Director.

[We are sure that this reassuring statement will be received with general satisfaction, and that the firm will be congratulated on the fact that manufacture has been so slightly interrupted and that the difficulties caused by the accident have now been largely overcome.—ED. *C.A.*]

Manchester Tar Conference

To the Editor of THE CHEMICAL AGE.

SIR,—I should like to make two corrections in the summary of my contributions to the Manchester Conference on Tar, reported in THE CHEMICAL AGE for December 4 (p. 540).

The hydrocarbon mentioned at the conference as being isolated by Dr. Pratt is β-methylanthracene, not anthracene. Our results so far do not exclude anthracene with certainty, but there is present in the tar oils a complex mixture of anthracene derivatives, the separation of which is a matter of considerable practical difficulty.

Regarding naphthalene, we have no definite opinion, but hitherto neither this hydrocarbon nor phenanthrene has been detected in our experiments on oils from tars distilled at temperatures ranging from 400° to 600°.—Yours, etc.,

G. T. MORGAN.

Chemical Research Laboratory,
Teddington, December 7.

German Coal Tar Products in U.S.

GERMANY'S exports of coal tar products to the United States in 1925 showed an increase in quantities of aniline dyes and colours, to 2,185,411 pounds, valued at $2,487,517.12, from 1,582,971 pounds, valued at $1,947,261 in 1924. Imports of "indigo and indigoid" rose from 76,965 pounds, valued at $52,938 in 1924, to 179,306 pounds, worth $121,203 in 1925. Miscellaneous coal tar products amounted to 3,204,530 pounds ($393,096.30), compared with 374,188 pounds ($125,741.10) in 1924. However, exports of creosote oil to the United States fell to 3,010,600 gallons ($409,362) from 6,768,208 gallons ($1,343,849) in 1924.

Electric Driving for Chemical Works

An Important Development

THE subject of electric driving of industrial establishments generally will become a much more important one in Great Britain in the immediate future, and a striking development in this connection is represented by the "P.I.V." (Positive Infinitely Variable) Gear, the standard form of which has already been described in these columns. By means of this gear it is possible to use the A.C. motor direct at any desired centres, so that in a chemical works, for example, it will no longer be necessary to instal transformers and to use D.C. motors to obtain the necessary variation in speed. An interesting example of this latest development was recently shown by the "P.I.V." Gear Syndicate, Ltd, at the Textile Exhibition, Leicester. The display included an open chain drive operating at any desired centres whereby with an A.C. motor running at 1,000 revs. per min., the driven shaft could be altered infinitely in speed between the range of 250–500 revs. per min., merely by adjusting a wheel control on the motor shaft. In this arrangement the special "P.I.V." opposed conical disc pulleys are fixed on the motor shaft with the "P.I.V." chain running between, while on the driven shaft there is a large fixed pulley with a groove having alternate ribs and channels to fit the chain; numerous modifications of this general principle can be used. In this way, for example, in chemical engineering, a variable speed feed mechanism for solids or liquids hitherto requiring a D.C. motor may now be operated quite easily with an A.C. motor.

Special Gear Box

Further, there was also exhibited at Leicester a special "P.I.V." gear box designed in this particular case to meet the requirements of artificial silk spinning. The driving shaft ran at a steady speed of 300 revs. per min., transmitting 3 to 4 h.p., and the driven shaft, starting at 330 revs. per min., gradually fell smoothly and continuously to 270 revs. during 50 mins., when it returned to 330 revs. again in a period not exceeding four seconds, and the whole cycle re-commenced automatically. The speeds and period could be adjusted as required, and this principle of driving is entirely new, while apparently capable of considerable extension to the chemical industries.

It will be remembered that the standard "P.I.V." design consists essentially of a pair of expanding pulleys of the opposed conical disc type, one set on each shaft, between which runs a chain of unique construction engaging positively with the pulleys at the edges as it runs between the "V" of the pulleys. The surfaces of the latter have alternate ribs and grooves so that the chain rises or falls in the latter as required, giving all the time a different effective driving diameter to the two pulleys and allowing therefore of infinite variation in speed ratio. Also the drive is truly positive, the engagement being obtained by each link having a longitudinal slot punched through and fitted with a sleeve filled tightly with upright thin steel plates or slats which are free to move transversely, and are gripped by the ribs, which play the part of teeth. The efficiency of power transmission is very high, up to 95 per cent., as shown by recent National Physical Laboratory tests, with negligible temperature rise and ability to take considerable overload.

Canadian Cobalt

FOR the past two decades Canada has been the main source of the world's supply of cobalt. Ores, concentrates and residues from the cobalt district of Ontario are shipped to the Deloro Smelting and Refining Co. at Deloro, Ontario, and to United States and European smelters. Cobalt is marketed in the form of black oxide containing about 71 per cent. of cobalt, as grey cobalt oxide containing about 76 per cent. of cobalt, as various salts of cobalt, and as metal. Computed as the sum of the cobalt contained in metal, oxides, salts, ores, concentrates and residues marketed during the period, the production of cobalt in the first half of 1926 amounted to 384,034 lb., netting the producers $695,730, as against 590,087 lb. valued at $1,239,133 in the first half of 1925.

U.S. Portland Cement in 1925

Record Production

FINAL figures relating to the Portland cement industry in 1925, compiled by the United States Bureau of Mines, Department of Commerce, show that the production of Portland cement in 1925—161,658,901 barrels—was the largest quantity manufactured thus far in any year, exceeding that in 1924, the next highest year in production, by 8 per cent. Shipments of Portland cement from mills in 1925 increased 8 per cent. in quantity and over 5 per cent. in gross value. The average factory price per barrel in bulk in 1925 was $1·77, a decrease of 4 cents per barrel as compared with 1924. Stocks at the mills also increased, reaching a total of 18,515,384 barrels on December 31, 1925, the greatest at the end of the year during which official records of stocks have been kept. They were about 31 per cent. higher than at the end of 1924.

From reports of the producers showing mill shipments of Portland cement into the various States, estimates of per capita consumption of the product in question have been compiled. These are at best but approximations as they represent only the records of mill shipments into States; they do not include the imports, which would increase the consumption in States nearest the seaports and in certain States near the Canadian border, nor do they make allowance for a variable, but considerable, stock of cement at all times in transit, in warehouses at distributing points, and awaiting use at jobs. The total manufacturing capacity of all the active plants at the end of 1925 was 193,391,000 barrels, according to manufacturers' reports supplemented by a few estimates. This total, which is subject to revision, includes the annual capacity—about 5,800,000 barrels of finished Portland cement—of six new plants that began operating during the year. They are located as follows: One each in Georgia, Michigan, Texas, and Virginia, and two in Ohio.

A summary of the monthly estimates of output of Portland cement in 1925, compiled from the monthly reports of producers, was published early in January, 1926, by the Bureau of Mines. These estimates, which indicated a production of 161,202,000 barrels and shipments of about 156,724,000 barrels, were within 0·3 and 0·4 per cent. respectively of the final figures for 1925.

Canadian Fertiliser Industry

Results In 1925

PRODUCTION from plants in Canada engaged primarily in the manufacture of complete fertilisers amounted in value to $1,437,787 in 1925. In addition, fertiliser materials such as calcium cyanamide, ammonium sulphate, animal tankage, ground bone, and fish fertilisers, were made in factories classified under other industries; in 1925, the production value of these commodities amounted to $6,259,496. Increases were noted in the output of acid phosphate, and in the production of complete fertilisers in the fertiliser industry proper, and greater tonnages were reported by the industries producing cyanamide, animal tankage, and ammonium sulphate. In addition to the manufactured fertilisers offered for sale there is also a large consumption for fertiliser purposes of imported nitrate of soda from Chile, and chloride and sulphate of potash from Germany. These salts are often applied directly to the soil, without being mixed with other fertiliser ingredients. It must be noted, however, that only a part of the sodium nitrate imported is used for fertiliser purposes.

Importations of sodium nitrate amount to about 22,000 tons annually, but consumption in acid manufacture takes 13,500 tons, and a further 1,300 tons are used in the preparation of complete fertilisers, leaving approximately 7,200 tons, most of which is probably used directly on the soil. Only 13 plants in Canada produced complete fertilisers as a major product; 6 were in Ontario, 3 in Nova Scotia, 2 in British Columbia, and 1 each in Manitoba and New Brunswick. Capital employed in these plants amounted to $2,095,608, and the number of persons employed the year round was 201. Payments in salaries and wages totalled $205,173, and materials used in manufacture cost $1,045,294. The production of calcium cyanamide amounted to 90,612 tons, valued at $3,839,363, as compared with 72,491 tons, valued at $3,303,984, produced in 1924.

Calcining of Small Limestone

IN theory the calcination of small limestone seems to be very simple, states W. M. Myers, associate mineral technologist, Bureau of Mines, in Serial 2762, recently issued. It is only necessary to heat the stone to a point where calcium carbonate, and any magnesium carbonate present, will dissociate into calcium oxide and magnesium oxide, with an evolution of carbon dioxide, and to maintain this temperature until the reaction is complete, leaving lime. The temperatures required are not excessive. Many limestones will begin to break down apparently when heated to 600° C. As the temperature is increased the rate of reaction is greatly increased. The temperature in the average lime kiln will generally vary between 1,050° and 1,250° C., depending on the chemical composition and physical properties of the stone and the type of fuel employed. Metallurgically such temperatures are neither very high nor difficult to obtain. In actual practice, however, the calcination of small stone presents many difficulties. The introduction of small stone in any type of ordinary shaft kiln blocks the draught so that continued operation is impossible. The carbon dioxide evolved from the stone and from the combustion of the fuel must be continuously removed, or a partial pressure will develop in the kiln which will prevent further reaction. To be successful any device utilised for the calcination of small stone must handle the material in commercial tonnages, and produce lime with a fuel consumption comparable to average kiln operation. A new method for the manufacture of lime from small stone by the use of a sintering machine is described in Serial 2762, copies of which may be obtained from the Bureau of Mines, Department of Commerce, Washington, D.C.

1927 Export Possibilities

THE December issue of *The Export World* is a special number entitled "1927 Exports: Review of Future Plans and Prospects." In the compilation of this issue there are analysed, industry by industry, the potential production and marketing, gauging the buying power and prospective demands of each country. The special articles include the following:—"The Future of New Zealand," by Sir James Parr, K.C.M.G., High Commissioner for New Zealand; "The Imperial Conference, 1926," specially contributed by officials of the various Dominion Governments; "The Gold Coast in 1927," by Lt.-Col. J. H. Levey, D.S.O., O.B.E., Director of the Gold Coast Commercial Intelligence Bureau; "The Exports of British Columbia," contributed by officials of the several Producers' Associations of that Province; "Newfoundland in 1927," by Captain Victor Gordon, High Commissioner for Newfoundland; "Banking in 1927," by E. C. Warren, B.Com.; "Motors, Cycles, etc.," including an article by Sir Harold Bowden, Bt.; "Leather," by J. G. Purcell, special correspondent of *The Shoe and Leather Record, Footwear Organiser*, etc.; Overseas Representation, including a careful examination of a serious problem, with a guide to recommended overseas agents; Communications by Rail, Road, Sea and Air, including "The Future of Radio-Telegraphy," by Daniel Bonney; "Insulators and Insulating Materials," by C. W. Phillips; and "The Future of Textile Exports," by Sir Charles Macara. This special number is published at 2s. 6d. post free.

Complex Hydrocarbons in Low-Temperature Tar

DRS. G. T. MORGAN and D. D. Pratt, of the Chemical Research Laboratory, Teddington, announce in a communication to "Nature" that from a tar produced by distillation of Pooley-Hall-Wearmouth coal carbonised at 600° C., a fraction boiling at 313° to 360° C. was obtained, which yielded a complex mixture of aromatic hydrocarbons distinguished even in an impure state by their bright colours. Predominant among these hydrocarbons was β-methylanthracene, which was identified by conversion to the corresponding anthraquinone derivative and comparison of the latter with the synthetic product. Investigation of these complex aromatic derivatives from low-temperature tars is being continued at the Chemical Research Laboratory in collaboration with H.M. Fuel Research Station.

Japanese Synthetic Ammonium Sulphate

THE Nippon Chisso Kaisha (Japan Nitrogen Company) is increasing the annual capacity of its Nobeoka plant from 20,000 tons of sulphate of ammonia to 50,000 tons, and its Mizumata plant from 30,000 tons to 50,000 tons, in addition to which it proposes shortly to erect in Chosen (Korea) a plant with an annual capacity of 100,000 tons. The Dai Nippon Jinzo Hiryo Kaisha (Great Japan Artificial Fertiliser Company) is making progress with plans for the purchase of 12,500 kilowatts of electricity at 95 yen per year per kilowatt, to be used in a plant to be constructed in Toyama prefecture, with a capacity of 25,000 tons of sulphate of ammonia annually. The Denki Kagyo Kaisha (Electro-Chemical Manufacturing Company) has doubled its capital for the announced purpose of establishing a plant for the production of 30,000 tons of sulphate of ammonia per annum. The production of sulphate of ammonia in Japan during 1925 amounted to approximately 130,000 tons, so that when the projected developments above referred to are completed production will be doubled. The consumption of sulphate of ammonia in Japan increased from 120,000 tons in 1914 to 330,000 tons in 1925, and is expected to reach 400,000 tons for 1926. In 1925 the portion of the requirements of the market supplied by imports amounted to 60 per cent. There is a similar increase in the demand for sulphate of ammonia in Chosen and Taiwan. This increase is due to the fact that bean cake, which has hitherto been chiefly esteemed among nitrogen fertilisers, cannot meet the growing demand.

River Pollution by Beet Factories

THE pollution of rivers by the discharge of waste products from sugar-beet factories has been engaging the attention of the Fisheries Department of the Ministry of Agriculture and Fisheries for some time, and it has been decided to call a conference, to which technical representatives of the sugar-beet industry will be invited, in order that the whole problem may be closely reviewed. Complaints of fish poisoning by effluents from sugar-beet factories have been numerous, particularly with regard to the River Lark, in which serious pollution has been reported in a stretch of the stream near the Bury St. Edmunds sugar-beet factory. Other complaints have been received from Ely and Ipswich. The Ministry, through the Foreign Office, have made inquiries abroad, in the hope of acquiring knowledge of the treatment of such effluents from the experience of old-established factories, but the result has afforded no guidance to the Ministry.

Investigations have been made into complaints of the Lark Angling Society, and it appears that the recent serious pollution which destroyed stream life in a stretch of five miles was due to the washing water discharged into the river from the factory. Apparently the process of screening, which forms an essential part of the treatment, had been omitted in error. Arrangements have been made to discharge such water into large settling pits, where, before its discharge into the river, it will remain long enough to allow the mud to settle.

United States Potash Exploration

THE area officially selected for the beginning of the United States Federal Government's effort to find domestic supplies of potash, which it is hoped may render the United States independent of foreign producers of this essential material, lies in the north-west corner of Section 4, William Teer Survey, Upton County, Texas, and centres about the Dixie Hughes No. 1 oil well, it is announced by the Bureau of Mines of the Department of Commerce. This area, which has been recommended by the United States Geological Survey for potash exploration, is located in a territory now developing as an oil field, oil production being obtained at an average depth of 2,000 feet. The depth to the top of the potash-bearing salts is 435 feet. The total depth recommended for test holes is 1,300 feet. Mineralogical examination of a series of cuttings shows three horizons of excellent polyhalite.

Domestic production of potash in 1925 amounted to 51,544 short tons of crude potash salts, containing 25,459 short tons of potash (K_2O), which is equivalent to about one-tenth of the potash content of salts imported during the year. This production was from natural brines in California, dust from steel plants in Pennsylvania, and distillery residue from molasses at a plant in Maryland.

Chemical Matters in Parliament

Gas Warfare

Captain King, replying to Mr. Viant (House of Commons, December 2), stated that the Chemical Warfare Committee, the composition of which was given in the current Monthly Army List, acted as adviser on the various aspects of chemical warfare. Four out of twenty-five regular members of the Committee, and twelve out of over ninety associate members, were connected with the chemical industry.

Sodium Dinitrophenate

Mr. Forrest (House of Commons, December 2) asked the Home Secretary whether, in view of the recent explosion at Hickson and Partners' works at Castleford, he would have inquiries made into the nature of sodium dinitrophenate with a view to its being scheduled under the Explosives Act? The Home Secretary replied that the point was being inquired into in connection with the investigation into the explosion.

Sugar Beet

Replying to Lieut.-Colonel Windsor (House of Commons, December 6), Mr. Guinness stated that the yield, in tons per acre, of sugar beet in England and Wales during the last five years had been as follows: 1922, 6½; 1923, 6¼; 1924, 8; 1925, 8; 1926, 8 to 9.

Fertilisers and Feeding Stuffs Bill

The Fertilisers and Feeding Stuffs Bill (House of Commons, December 7) was read a third time and passed, with amendments.

Physical and Chemical Properties of Slate

SLATE is a natural rock, and, unlike a synthetic product, its properties are inherent and in large part are practically unchangeable, states the Bureau of Mines, in Serial 2766, recently issued. However, slates from different localities, and even from different parts of the same deposit, vary greatly in physical character and in chemical composition. By diversion of each type to the uses for which it is best adapted, more serviceable and dependable products are supplied than when little attention is given to adaptability. There is a growing tendency among slate producers to gain a better knowledge of the fundamental properties of their raw materials, and to utilise this knowledge in the selection of material best suited for its intended use. It has been learned, for example, that calcium carbonate is injurious in slate exposed in any way to sulphuric acid, because the hydrated calcium sulphate, gypsum, is formed, and its formation is accompanied by great expansion which disintegrates the slate. Fortunately most of the commercial slates in the United States are low in calcium carbonate, but it has been demonstrated that slates with any appreciable percentages should not be used where acid exposure is probable. It has also been found that slates vary greatly in transverse strength. Naturally the stronger slates should be used for stair treads, sills, caps, and other applications where a load must be carried.

Scientific Problems of Leather

AT the meeting of the London Section of the Society of Chemical Industry on Monday, Dr. R. H. Pickard, F.R.S., director of the Leather Research Association, gave a lecture on "Some Scientific Problems concerning the Leather Industry." Mr. C. S. Garland presided. Referring to the investigations now under way, he said that the work being carried out for the association was being done by a team of workers of which he was merely the captain, and the object of that team was to enable the practical man, with his skill, to produce good results more often than he otherwise would. If the Research Association could not help the practical man it was not the practical man's fault, but the fault of the association, and perhaps he could not do better than repeat the words he had used quite recently when addressing the trade, namely, that the Research Association had no hope of laying down recipes which would enable the trade to make the best leather all the time, but it hoped to be able to give them safeguards which would prevent them making bad leather at any time, The Research Association could not guarantee salvation but it would probably enable the trade to avoid damnation.

From Week to Week

MR. G. H. KENT KINGDON has been appointed chairman of Joseph Crosfield and Sons, Mr. C. F. Huffam having retired after nearly 50 years' service.

THE TITLE "CHEMOLOGIST" is being considered by the council of the Australian Chemical Institute with a view to obtaining in the charter of the Institute the sole right to the use of the title.

MR. W. S. MORRIS, chairman of R. R. Minton and Co., Ltd., has been elected president of the National Federation of Paint, Colour, and Varnish Manufacturers of the United Kingdom.

CZECHO-SLOVAKIA has joined the European steel pact concluded a short time ago between France, Belgium, Germany, and Luxembourg. Czecho-Slovakia's production quota will be one and a half million tons of steel.

SIX CASES OF ANILINE POISONING were reported in Great Britain and Northern Ireland, under the Factory and Workshop Act, during October, 1926, and two deaths in chemical factories and workshops occurred in the same month.

THE KELHAM SUGAR FACTORY, NEWARK, which is leased by the English Beet Sugar Corporation, Ltd., from Home Grown Sugar, Ltd., is working above its designed capacity, in order to cope with the great quantities of beet which are being delivered there.

THE CHEMICAL DEPARTMENT of Robert Gordon's College, Aberdeen, was destroyed, and the pharmaceutical and metallurgical departments damaged, by a fire which occurred last Sunday. The cause of the fire is unknown, but the damage is estimated at several thousands of pounds.

RECENT WILLS INCLUDE: Mr. Percy Cole, West Bank, Ashenhurst, Huddersfield, of Cole and Wilson, chemical manufacturers, and a member of the Huddersfield Town Council, £7,740; Mr. George Smithers Packer, of Sutton-on-Sea, formerly of Sheffield, metallurgist (net personalty £9,948), £10,888.

THE RAYON MANUFACTURING CO. are opening an artificial silk factory at Ashtead, Surrey, early next year, producing two tons of yarn a day. Sir Sydney Skinner, the chairman of the company, speaking at an informal inspection of the premises last week, declared that it was the aim of the directors to specialise only in the highest grades.

SIR T. M. LEGGE, H.M. Senior Medical Inspector of Factories, has resigned his position as from November 30. At Geneva, in 1921, acting as a representative of the British Government, he voted for the Draft Convention prohibiting the use of white paint for internal painting of buildings. In a letter to *The Times* he explains that he is unable to recede from the position he then took up.

GENERAL FRIES, chief of the United States Chemical Warfare Service, stated in his annual report, recently issued, that the effectiveness of poison gas was due more to the large number of temporary casualties produced than to the relatively small number of actual fatalities. The chemicals employed during the world war were probably about as effective for the production of casualties as any which might be discovered in the future.

THE LIBEL ACTION in which William Miller Kneale, 42, export agent, of Old Hall Street, Liverpool, was charged with publishing a defamatory libel of and concerning Mr. Francis D'Arcy Cooper, chairman of Lever Bros., and other directors of the company, was concluded at the Old Bailey last week. He was found guilty, and the Recorder sentenced him to nine months' imprisonment in the second division. Kneale intimated his intention of appealing.

APPLICATIONS ARE INVITED for the following appointments: Lecturer in Pharmacy and Chemistry at the Portsmouth Municipal College. Revised Burnham scale. The Secretary, Offices for Higher Education, the Municipal College, Portsmouth.—A Junior Assistant Chemist for the Directorate of Explosives Research. £160 plus bonus (£246). The Chief Superintendent, Research Department, Woolwich, London, S.E.18.—Professor of Organic Chemistry in the Egyptian University, Cairo. £922 10s. to £1,168 1s. plus travelling allowance. Information from the Director, Egyptian Educational Office, 30, Victoria Street, London, S.W.1. December 31.

THE FEDERATION OF BRITISH INDUSTRIES and the Federation of German Industry met last week-end, at the head office of the F.B.I., in St. James's Street, London. The German representatives included Dr. Duisberg, of the I.G., and the British representatives included Sir Max Muspratt, of "I.C.I." The object of the meeting was to discuss to what degree and in what manner the two organisations could co-operate for the furtherance of the mutual interests of the industries of their respective countries. The discussions were between the two organisations as a whole and not between representatives of individual industries. In a statement issued, it was emphasised that the question of international cartels or combines had not been discussed, still less had any combined action by British and German industry against the industry of any other country been mentioned or considered.

THE AGUAS BLANCAS NITRATE CO. announce that Mr. W. J. Leach has been elected chairman of the company, and Mr. Alexander Fergusson has been appointed managing director.

MAJOR A. G. LANE, B.Sc., has been appointed senior chemistry master of King's Norton Secondary School, after holding for over six years a similar position at the Smethwick Technical School.

THE BRITISH CAST IRON RESEARCH ASSOCIATION, Birmingham, has issued a report for 1925–26, which will be presented at the fifth annual meeting of the association on December 15, in London.

A MEMORIAL TABLET to Otto Unverdorben, the discoverer of aniline, has been affixed to his house at Dahme, Germany. The street opposite the house has received the name Unverdorbengasse.

AN EXPLOSION of 5,000 lb. of sorting powder occurred on Monday at the Dupont plant at Carney's Point, Wilmington, Delaware. The first reports indicated five dead and three injured. A serious fire followed the explosion.

POSSIBILITIES OF SUGAR BEET GROWING in Aberdeenshire are being investigated by the Aberdeen County Executive of the National Farmer's Union. A committee has been formed, and it has been decided that the growing of sugar beet is a feasible proposition.

NITRATE PRODUCERS' ASSOCIATION sales of nitrate during the past fortnight amounted to 14,000 tons, state Aikman (London), Ltd., making total sales for shipment after June 1 last 742,000 tons, against 1,688,000 tons for the corresponding period of 1925.

IN THE CHANCERY DIVISION recently Mr. Justice Astbury confirmed the reduction of capital of Frederick Boehm, Ltd., from £100,000 to £70,000. It was intended, said Mr. Holmes for the company, to write off 10s. per share from the ordinary shares.

SIR MAX MUSPRATT presided, on Wednesday, at the fifth Ramsay Chemical Dinner, held in Glasgow. Sir Gregory Foster, provost of University College, London, Mr. F. H. Carr, president of the Society of Chemical Industry, and Professor G. G. Henderson, president of the Institute of Chemistry, were among those present.

THE APPOINTMENTS of Mr. G. A. Julius, Mr. W. J. Newbigin, and Professor A. C. D. Rivett for five years as nominated members of the Australian Federal Council for scientific and industrial research have been approved by the Governor-General. Mr. Julius has been appointed chairman at an annual salary of £1,000. The remaining appointments have an annual salary of £500.

MR. BRYNMOR THOMAS has been appointed Adviser in Agricultural Chemistry in Armstrong College, Newcastle, to take the place of Mr. S. H. Collins, who has retired from the position after 28 years' service. Mr. Collins, after training at University College, London, and in the laboratories of the Royal Agricultural Society, went in 1892 to India as assistant agricultural chemist to the Government there, remaining until 1898.

THE ANNUAL DINNER of the Imperial College of Science and Technology, South Kensington (incorporating the Royal College of Science, the Royal School of Mines, and the City and Guilds (Engineering) College), will be held at 7.30 p.m. on Monday, December 13, at the Hotel Cecil. The chair will be taken by Sir Thomas H. Holland, rector of the college, and the list of speakers will include Sir Alfred Mond, Mr. Prideaux, Sir John Cadman, and Sir Sefton Brancker.

AN ISSUE OF 140,000 6½ PER CENT. cumulative preference shares of £1 each, and 140,000 ordinary shares of £1 each in Associated Dyers and Cleaners, Ltd., was offered for public subscription last week, at par. This company are proprietors of the business of Eastman and Son, dyers and cleaners, Acton Vale, London, and holders of the entire issued capital of J. Pullar and Sons, Ltd., cleaners and dyers, Perth, the latter firm being the owners of Perth Dye Works. The issue was over-subscribed.

THE MINISTRY OF AGRICULTURE attaches so much importance to the growing of sugar beet in this country, that it has sent a commission to Germany to investigate, among other matters, recent improvements in scientific manuring and methods of cultivation. The Commission consists of Sir Francis Floud, Permanent Secretary to the Ministry of Agriculture, and Mr. A. W. Street and Mr. J. H. Gorvin, who, under Sir Francis Floud, are responsible for the sugar-beet section. On their return journey they will continue their investigations in Belgium.

THE WILLARD GIBBS GOLD MEDAL, one of the chief honours in American chemistry, will be awarded this year to Professor J. J. Abel, of the Medical School of Johns Hopkins University. The medal is given annually by the Chicago Section of the American Chemical Society to a chemist whose work in either pure or applied chemistry has received world-wide recognition. Numerous institutions, including Cambridge University, have bestowed honorary degrees upon Professor Abel, who occupies the chair of pharmacology at Johns Hopkins, and is editor of the *Journal of Pharmacology and Experimental Therapeutics*. Professor Abel's research has been largely in the field of glandular extracts. He was the first to isolate the drug epinephrin.

Obituary

DR. RICHARD MEYER, for many years professor of chemistry in the Brunswick Technical High School, aged 80.

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ACIDS.—A compound of sulphuric anhydride with nitric oxide and the theory of the lead chamber process. W. Manchot. *Ber.*, November 10, 1926, pp. 2672–2681.

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CYANIDES.—The preparation of calcium cyanide. H. H. Franck and C. Freitag. *Z. angew. Chem.*, November 25, 1926, pp. 1430–1432.

DEHYDROGENATION.—Further studies on dehydrogenation catalysis: polycyclic hydrocarbons. N. D. Zelinsky, I. Titz and L. Fatejew. *Ber.*, November 10, 1926, pp. 2580–2590.

Formation of condensed ring systems by dehydrogenation catalysis. N. D. Zelinsky, I. Titz and M. Gaverdowskaja. *Ber.*, November 10, 1926, pp. 2590–2593.

GENERAL.—Experiments on the biochemical and colloid-chemical action of potassium. K. Scharrer and A. Strobel. *Z. angew. Chem.*, December 2, 1926, pp. 1481–1486.

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ORGANO METALLIC COMPOUNDS.—Rubidium and caesium alkyls. A. v. Grosse. *Ber.*, November 10, 1926, pp. 2646–2654.

OXIDES.—On carbon suboxide. O. Diels and K. Hansen. *Ber.*, November 10, 1926, pp. 2555–2560.

REACTIONS.—Action of molecular oxygen and hydrogen on sodium azide. K. A. Hofmann and U. Hofmann. *Ber.*, November 10, 1926, pp. 2574–2579.

VISCOSE.—Viscose artificial silk manufacture. Part VIII. E. Wurtz. *Chem. Apparatur*, October 25, 1926, pp. 237–238.

VISCOSE.—Viscose artificial silk manufacture. Part IX. E. Wurtz. *Chem. Apparatur*, November 10, 1926, pp. 248–250.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

260,638. Dyes and Dyeing, Improvements in and relating to. B. Wylam, J. E. G. Harris, J. Thomas, and Scottish Dyes, Ltd., Murrell Hill Works, Carlisle, Cumberland. Application date, April 30, 1925.

In Specification 247,787 (see The Chemical Age, Vol. XIV, p. 334) is described the production of a red water-soluble derivative of leuco-flavanthrone by treating flavanthrone with an alkylsulphuric halide in presence of a metal and an organic base, and in Specification 245,587 (see The Chemical Age, Vol. XIV, p. 184A) is described the preparation of a blue derivative by treating leuco-flavanthrone with an alkylsulphuric halide in presence of an organic base. It is now found that the red derivative can be prepared from leuco-flavanthrone and an alkylsulphuric halide in presence of a tertiary base if the temperature of reaction is above about 50° C. It is also advantageous to use the tertiary base in excess of the proportion of 1 molecule of base to 1 molecule of alkylsulphuric halide. According to an example, the leuco-flavanthrone is treated with methylsulphuric chloride and pyridine at 60° C. and the product converted into an ammonium or sodium salt. The latter can be dyed or printed on to the usual textile fibres and the yellow shade of flavanthrone developed thereon by hydrolysis and oxidation.

260,639 and 260,640. Stable Iron Carbonyl Compositions, Production of. J. Y. Johnson, London. From the Badische Anilin und Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, May 2, 1925.

260,639. Iron carbonyl is decomposed by light, even in presence of a diluent. It is now found that mixtures of iron carbonyl with liquid hydrocarbons can be stabilised against the action of light by adding thereto a colouring matter, organic acid, ester, or other organic oxygen containing compound of high molecular weight capable of acting as a protective colloid, or a solid or liquid hydrocarbon boiling above 275° C. The addition may be made to solutions intended for direct use such as those of Specification 226,731 (see The Chemical Age, Vol. XII, p. 115), for example, gasoline containing 0·3 per cent. of iron carbonyl, or more concentrated solutions of iron carbonyl prepared according to Specification 260,640, an abstract of which appears below. The following compounds are mentioned as suitable: the iron compound of acetylacetone, 1 : 4 di-*p*-toluidoanthraquinone, the azo dye from aminoazobenzene and ethyl-beta-naphthylamine, typophor black, oil brown, naphthenic acids, and caoutchouc. The amount added may be 0·001 to 0·1 per cent.

260,640. Iron carbonyl is mixed with a relatively small amount of a liquid organic diluent such as a hydrocarbon, or mixtures of hydrocarbons, or their halogen derivatives, or alcohols. The mixtures, as compared with pure iron carbonyl, are less inflammable and less liable to spontaneous ignition, and can thus be stored and handled with greater safety. They may contain from 20 to 80 per cent. of the diluent, 50 per cent. of benzol or gasoline being specified as suitable.

260,647. Dyes and Dyeing, Improvements in and Relating to. B. Wylam, J. E. G. Harris, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirlingshire. Application date, June 4, 1925.

The preparation of water-soluble derivatives of leuco vat dyestuffs by treating the leuco-compounds with an alkylphosphoric halide or phosphorus oxychloride has already been described. According to the present invention similar water-soluble compounds can be made directly from the vat-dyestuffs themselves by treatment with alkylphosphoric halides or phosphorus oxychloride in the presence of a metal and a tertiary base. The use of methylphosphoric acid dichloride, pyridine and zinc dust is described in the examples given, the following being the vat dyestuffs employed: indanthrone, dimethoxy-dibenzanthrone, Caledon brilliant purple RR (chlorinated isodibenzanthrone), Caledon red BN (anthraquinone-1 : 2-naphthacridone), and flavanthrone. Other metals such as copper and other tertiary bases such as quinoline or dimethylaniline can also be used. The products dye cotton, wool, silk, etc., by the methods described in Specifications 245,587 and 247,787 (see The Chemical Age, Vol. XIV, pages 184A and 334).

260,682. Development Baths for Use in Dyeing, Preparations for. J. Y. Johnson, London. From Badische Anilin und Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, August 5, 1925.

When solutions of diazonium compounds are required for use in the production of azo dyes on the fibre it has been usual to produce such solutions from the corresponding amines, an acid, and a nitrite, since the known preparations containing diazo salts in solid form are somewhat unsatisfactory owing to their imperfect stability. The present preparations consist of dry, solid mixtures made by mixing a neutral or acid salt of an aromatic amine, capable of being diazotised, with a dry nitrite; the mixtures may also contain a compound of an acid character such as an alkali metal bisulphate, naphthalene-trisulphonic acid, or solid mineral or organic acids. The salts of aromatic amines may be replaced by *N*-sulphonic acids of the amines, or even by the free amines if a solid acid substance is also present. Solid diluents such as aluminium sulphate, alum, magnesium chloride, or salts of arylsulphonic acids may be added. The mixtures yield diazo solutions directly when dissolved in water, or dilute acid. As it is important that the mixtures be well wetted when added to the water, they may advantageously contain an agent which assists wetting, such as Turkey red oil, salts of alkylnaphthalene-sulphonic acids, etc. A large number of examples are given of mixtures suitable for preparing the diazo solutions commonly required in the dyeing industry.

260,686. Removal of Tar Acids from Ammonia and Other Liquors. H. W. Robinson, Exchange Buildings, Stephenson Place, Birmingham, and D. W. Parkes, Ryders Green, West Bromwich. Application date, August 7, 1925.

It is found that although activated carbon will not remove tar acids from ordinary ammonia liquors, this can be accomplished if they are first saturated with a mineral acid such as carbon dioxide. The tar acids can then be recovered from the used carbon by distilling them off with steam superheated to 300° C., the carbon being heated to 370-600° C. The carbon should then be cooled in a current of inert gas before further use. The purification may be carried out with successive batches of liquor, the active carbon being agitated therewith and then filtered off, or as a continuous process. In the latter case the ammonia liquor, after treatment with carbon dioxide, is passed in succession through a series of chambers containing the carbon. By a series of three-way taps and pipes each chamber may be made in succession the first of the series, while one or more chambers are excluded from the series for the purpose of being heated externally, while superheated steam is passed through to remove the tar acids which are condensed and collected. The whole of the tar acids can be removed and about 80 per cent. recovered from the carbon.

260,830. Chromium Compounds of Azo-dyestuffs, Manufacture of. O. Y. Imray, London. From the Society of Chemical Industry in Basle, Basle, Switzerland.

It is known that azo dyes capable of being chromed can be converted into chromium compounds by treatment with a chromium salt or a chromate. The so-called chromic chromates have now been found suitable for the purpose. Examples are given according to which the azo dyestuffs from diazotised 4-chlor-1-aminobenzene-3-sulphonic acid and

salicylic acid, and that from diazotised 1 : 2-aminonaphthol-4-sulphonic acid and β-naphthol, are boiled with chromic chromate ; the latter is obtained from potassium bichromate and either sodium thiosulphate or alcohol. The dyeing properties of the chromium compounds of a number of other azo dyes prepared from diazotised *o*-aminophenols or *o*-aminonaphthols and phenylmethyl-pyrazolone, α- or β-naphthol, naphthionic acid, or 1-naphthol-5-sulphonic acid, are tabulated. The compounds dye wool in level red, blue, green, and brown shades which are fast to light.

260,885. Chrome Alums, Improvements in the Manufacture of. W. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 28, 1926.

It is found that the crystallisation of chrome alum from its solutions, which process as ordinarily conducted requires 4 to 6 weeks, can be effected almost immediately if a chromium sulphate solution, after acidification, is heated to 30-45° C., the necessary potassium sulphate added, and the liquid rapidly cooled while stirring well. The strongly acid mother liquor is employed in a new cycle of operations. The crystallisation is so rapid that a continuous method of working becomes practicable.

260,888. Reducing Gases in Copper Apparatus, Method of Working with. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 2, 1926.

When copper or copper-alloy apparatus is subjected to the action of hydrogen or other reducing gases at temperatures above 100° C. and especially at very high pressures as in the synthesis of methanol from oxides of carbon and hydrogen, it frequently becomes permeable to the said gases. This difficulty is due to the presence in the metal of small quantities of copper oxide which becomes reduced to a finely perforated metal. It can be overcome by protecting the inner walls of the apparatus by means of a layer of an inert gas. Thus the copper, or copper-lined vessel may be provided with an inner wall and the inert gas passed through the annular space so formed and at substantially the same pressure as the reaction gases, so that the inner wall need not be made to resist pressure.

260,908. Solid Polymers of Formaldehyde, Manufacture of. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 26, 1925.

The preparation of solid polymers of formaldehyde, which is usually effected by concentrating or dehydrating aqueous solutions thereof, is effected by removing water from gas mixtures consisting of formaldehyde and water vapour, with or without inert gases, and then separating the solid product from the gases by filtering, electric precipitation, or on cooled surfaces, etc. The water may be separated by rapid cooling, for example, by passing the gases in an upward direction through a cooler and removing the condensate. The formaldehyde polymers may be obtained varying in consistency between butter-like solids and a dust-like powder. The gaseous mixtures produced by the catalytic oxidation of methanol and particularly methanol containing little or no water can be used directly according to the invention. Examples are given in which the formaldehyde-containing gases are cooled by passing them upwards through a condenser, or downwards on to the surface of well cooled formaldehyde solution : the formaldehyde remaining in the gases largely polymerises and is collected in separation chambers.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention : 246,482 (Soc. Anon. des Matières Colorantes et de Produits Chimiques de Saint Denis, R. Lantz, and A. Wahl), relating to the manufacture of derivatives of naphthoquinones, see Vol. XIV, p. 335 ; 249,510 (A. Oppe), relating to mixtures of alkali hypochlorite and alkali chloride in solid form, see Vol. XIV, p. 551 ; 250,219 (P. Moro), relating to xanthate of cellulose, see Vol. XIV, p. 578 ; 250,893 (Sharpe and Dohme), relating to production of acylresorcinols, see Vol. XV, p. 13.

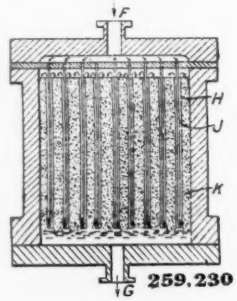
International Specifications not yet Accepted

259,214. Distilling Liquids and Solids. T. Chmura, 48 Karmelicka, Cracow, Poland. International Convention date, September 29, 1926.

The distillation of substances such as oils, fats, mineral wax, lignite, anthracite, wood, turf, tars, resins, perfumes, ichthyol, etc., is effected by the direct or indirect action of superheated vapours of benzene, or its hydrogenated derivatives, or methylcyclopentane. The vapours may be mixed with hydrogen, steam, carbon dioxide, etc. An apparatus is described consisting of a boiler for the benzene, a superheater, the inside of which may be coated with ferrous sulphide, a series of distilling vessels and a series of condensers for the distilled substances. The uncondensed vapours are returned to the superheater. The superheated vapours may also be passed through the vertical tubes of a still, the liquid to be distilled flowing as a film down the outside of the tubes.

259,230. Ammonia Synthesis. F. Uhde, Bövinghausen, Westphalia, Germany. International Convention date, October 2, 1925.

In an apparatus for the catalytic synthesis of ammonia, in order to avoid overheating of the catalyst a series of double



259,230

tubes H, J pass through the catalyst mass. The gases enter at F, and pass through the inner pipes J, and the outer pipes H, in such a way that the flow through the catalyst is in the same direction as through the inner pipes ; they leave the apparatus at G.

259,233. Disinfectants. P. L. V. Jamotte, 10, Place de Louvain, Brussels. International Convention date, October 1, 1925.

A solution possessing disinfectant properties, and stated to contain a compound of bromine with a dipolymer of formaldehyde, is prepared by treating methyl alcohol with bromine and hydrogen peroxide in the presence of vanadium chloride and mercury.

259,245. Organo-arsenic Compounds. A. Albert, 46, Elizabethstrasse, Munich, Germany. International Convention date, October 3, 1925.

Trivalent or pentavalent organo-arsenic compounds are treated with hypophosphorous acid or its salts in order to prepare arsenobenzenes in a crystalline condition. In the case of the pentavalent arsenic compounds small quantities of hydriodic acid or iodides can advantageously be added. Examples are given of the preparation of arsenobenzenes by this method from *m*-hydroxybenzaldehydearsinic acid semicarbazone, *m*-hydroxyacetophenonearsinic acid semicarbazone, *p*-hydroxy-*m*-acetylaminophenylarsinic acid, and *p*-acetophenonearsine oxide.

Latest Notifications.

262,075. Process for the production of cobaltous acetate. I. G. Farbenindustrie Akt.-Ges. November 27, 1925.

262,081. Method of simultaneously working up a plurality of gas currents of different sulphur dioxide- and water-contents into sulphuric acid, sulphite lye, and the like. Metallbank und Metallurgische Ges Akt.-Ges. November 25, 1925.

262,086. Process for the recovery of dehydrogenation products and the like. I. G. Farbenindustrie Akt.-Ges. November 27, 1925.

262,090. Production of synthetic ammonia and acetylene. Omnium des Industries Chimiques Procedes Tocco and Landi. November 27, 1925.

262,097. Nitration process. Battegay, M. November 24, 1925.

262,099. Conversion of moist solid fuels into valuable liquid products. I. G. Farbenindustrie Akt.-Ges. November 26, 1925.
262,101. Manufacture and production of monocarboxylic acids, I. G. Farbenindustrie Akt.-Ges. November 27, 1925.
262,119. Manufacture and production of 1-diazoanthraquinone-2-carboxylic acids. I. G. Farbenindustrie Akt.-Ges. November 28, 1925.
262,120. Catalytic dehydrogenations. I. G. Farbenindustrie Akt.-Ges. November 30, 1925.
262,131. Processes for the filtration and separation of liquids and solutions. Ultra-Filtre, D. M. S. November 26, 1925.
262,141. Manufacture of thiazole derivatives of 1 : 4 naphthoquinone. I. G. Farbenindustrie Akt.-Ges. November 28, 1925.
262,155. Manufacture of symmetrical diarylguanidines. Chemische Fabrik auf Actien (vorm. E. Schering). November 30, 1925.

Specifications Accepted with Date of Application

238,574. Manufacture of derivatives of benzanthrones. Farbwerke vorm. Meister, Lucius, and Brüning. August 15, 1924.
240,801. Processes and apparatus for making sulphur dioxide and sulphuric acid. Graesselli Chemical Co. October 4, 1924.
242,635. Electrolyser for the production of hydrogen and oxygen. "Montecatini" Soc. Generale per l'Industria Mineraria et Agricola. November 7, 1924.
243,356. Pure aluminium hydrate. E. L. Rinman. November 22, 1924.
249,555. Moulded silicic acid gel. M. Praetorius and K. Wolf. March 21, 1925.
251,942. Obtaining sulphur from alkaline earth sulphates. Salzwerke Heilbron Akt. Ges., T. Lichtenberger, and K. Flor. January 29, 1926.
251,985. Condensing metallic vapours. New Jersey Zinc Co. May 5, 1925.
252,152. Production of carbon. F. Fischer and H. Tropsch. May 15, 1925.
252,747. Purifying quartz. British Thomson-Houston Co., Ltd. June 1, 1925.
253-519. Manufacture of resinous compositions. Metropolitan-Vickers Electrical Co., Ltd. June 10, 1925.
257,229. Manufacture of a brown pigment containing titanium. Deutsche Gasgluhlicht-Auer Ges. August 22, 1925.
261,139. Intermediates, dyes, and dyeing. J. E. Harris, B. Wylam, J. Thomas, and Scottish Dyes, Ltd. May 21, 1925.
261,449. Production of wrought iron. E. F. Blessing. July 17, 1925.
261,459. Nitro-derivatives of aromatic amines. J. W. Leitch and Co., Ltd., and A. E. Everest. August 13, 1925.
261,472. Condensation products from mono- and di-cyclic phenols and aldehydes. Chemische Fabriken Dr. K. Albert Ges., A. Amann, and E. Fonrobert. August 19, 1925.
261,494. Cellulose-containing solutions. A. Classen. September 3, 1925.
261,510. Vat dyestuffs of the anthraquinone series. A. G. Bloxam. (*Chemische Fabrik Griesheim-Elektron.*) September 23, 1925.
261,522. Synthetic resins. Chemische Fabrik Dr. K. Albert, A. Amann, and E. Fonrobert. October 12, 1925.
261,528. Treatment of magnesium or its alloys to be used for casting. G. Michel. October 17, 1925.
261,559. Production of hydrocyanic acid. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 14, 1925.
261,568. Azo-dyestuffs. W. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) January 1, 1926.
261,647. Manufacture of chromates. W. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*)

Applications for Patents

British Celanese, Ltd., Dreyfus, H., and Haney, C. I. Treatment of organic liquids. 30,356. November 30.
British Dyestuffs Corporation, Ltd., Hall, N., and Payman, J. B. Manufacture of aromatic acid anhydrides. 30,202. November 29.
British Dyestuffs Corporation, Ltd., and Hailwood, A. J. Artificial cellulose materials. 30,316. November 30.
British Enka Artificial Silk Co., Ltd. Production of acetyl cellulose compounds, etc. 30,224. November 29. (Holland, December 24, 1925.)
Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Isatins of the naphthalene series. 30,462. December 1.
Carpmael, W. Dyestuffs. 30,463. December 1.
Chemische Fabrik auf Actien, vorm. E. Schering. Manufacture of symmetrical diarylguanidines. 30,351. November 30. (Germany, November 30, 1925.)
Coley, H. E. Reduction of ores, etc. 30,788, 30,789. December 4.
Dreyfus, H. Treatment of materials containing cellulose derivatives. 30,630, 30,631. December 3.
Garland, C. S. Apparatus for separating emulsified liquids. 30,331. November 30.
Henkel et Cie, Ges. Manufacture of glycerin. 30,407. December 1. (Germany, January 25.)
Henkel et Cie, Ges. Manufacture of glycerin. 30,408. December 1. (Germany, January 26.)
Henkel et Cie, Ges. Manufacture of glycerin. 30,469. December 1. (Germany, January 27.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of thiazol derivative, of 1 : 4-naphthoquinone. 30,158. November 29. (Germany, November 28, 1925.)
I. G. Farbenindustrie Akt.-Ges. Production of phosphorus acids and hydrogen. 30,568. December 2. (Germany, December 3, 1925.)
I. G. Farbenindustrie Akt.-Ges. Production of phosphorus acids and hydrogen. 30,645. December 3. (Germany, December 3, 1925.)
I. G. Farbenindustrie Akt.-Ges. Purification of hydrogen. 30,646. December 3. (Germany, December 4, 1925.)
I. G. Farbenindustrie Akt.-Ges. Purification of alkali metal cyanide solutions. 30,647. December 3. (Germany, December 4, 1925.)
I. G. Farbenindustrie Akt.-Ges. Indigoid dyestuffs. 30,655. December 3. (Germany, December 4, 1925.)
Mannich, C. Manufacture of alkyl- and aralkyl derivatives of cyclo-trimethylene-aryl-pyrazolones. 30,409. December 1. (Germany, December 31, 1925.)
Marks, E. C. R., and U.S. Industrial Alcohol Co. Production of alcohol. 30,216, 30,217, 30,218. November 29.
New Jersey Zinc Co. Manufacture of lithopone. 30,543, 30,549. December 2. (United States, December 15, 1925.)
Paterson, K. R. Centrifugal separators. 30,418. December 1.
U.S. Industrial Alcohol Co. Production of alcohol. 30,219. November 29. (United States, March 30.)
U.S. Industrial Alcohol Co. Non-corrosive alcohol composition. 30,442. December 1. (United States, April 6.)

Papers at Chemical Society Meeting

THE following papers will be read at the next ordinary meeting of the Chemical Society, at Burlington House, London, on Thursday, December 16, at 8 p.m.: "On active nitrogen. Part I. The heat of formation and nature of active nitrogen," by E. J. B. Willey and E. K. Rideal; "Low temperature oxidation at charcoal surfaces. Part III. The behaviour of blood charcoal and the influence of temperature on the reaction rate," by E. K. Rideal and W. M. Wright; and "Investigations on the dependence of rotatory power on chemical constitution. Part XXXI. The resolution of a sulphilimine into its optically active forms," by S. G. Clarke, J. Kenyon, and H. Phillips.

New Applications of Bakelite

THE latest application of Bakelite is the use of "Formite" Bakelite cement A.R. for making self-hardening joints on boilers, steam circuits, chemical plant joints, etc. The Damard Lacquer Co., Ltd., of Birmingham, claim that this application has been proved successful on their plant, and that the joints are pronounced by their engineers and staff to be definitely superior to materials previously employed. The hardened cement joint proved resistant to steam, boiling water, organic solvents and vapours, weak mineral acids and alkalies, organic acids, hot and cold oils, etc. The "Formite" Bakelite cement A.R. is wiped on the usual joint or gasket and screwed home. The heat of working conditions does the rest.

Standard Required for Ice Cream

AT a conference of the representatives of the National Federation of Dairymen's Associations, the Ice Cream Association, and the National Farmers' Union held recently, a motion was adopted recommending the Government to fix a minimum butter fat standard for ice cream. It was also agreed that it should be left to representatives of the National Farmers' Union to approach the Ministry of Agriculture informally as a preliminary to joint representations being made to the Ministry of Health, with the object of securing the introduction of a Government Bill to prescribe a legal standard for ice cream.

PERCY SIDNEY HUNT, manager of the chemical department of Barnett and Foster, distillers and engineers, of London, was sentenced to three years penal servitude at the Old Bailey on Tuesday. He admitted defrauding his employers of £3,000. The frauds had been going on for six years.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton; powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £23 per ton. Powder, £24 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 11d. to 3s. 4d. per gall.; pyridinised industrial, 3s. 1d. to 3s. 6d. per gall.; mineralised, 4s. to 4s. 4d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¾d. to 7d. per lb. Crude 60's, 1s. 8d. to 1s. 10d. per gall.

ACID CRESYLIC 99/100.—2s. 6d. per gall. Steady. 97/99.—2s. to 2s. 1d. per gall. Pale, 95%, 1s. 10d. to 2s. 3d. per gall. Dark, 1s. 9d. to 2s. 3d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOL.—Crude 65's, 1s. 3d. to 1s. 5d. per gall., ex works in tank wagons. Standard Motor, 1s. 8½d. to 2s. 3d. per gall., ex works in tank wagons. Pure, 2s. 3d. to 3s. per gall., ex works in tank wagons. Scarce and firm.

TOLUOL.—90%, 2s. to 3s. per gall. Firm. Pure, 2s. 3d. to 3s. 6d. per gall.

XYLOL.—2s. 3d. to 3s. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8¾d. to 9d. per gall. Firm.

NAPHTHA.—Crude, 10d. to 1s. 1d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 2d. per gall. Solvent 95/160, 2s. to 2s. 1d. per gall. Solvent 90/190, 1s. 3d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £7 10s. per ton. Whizzed or hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £11 to £12 10s. per ton. Quiet. Flaked, £11 to £13 per ton, according to districts.

PITCH.—Medium soft, 170s. to 200s. per ton, according to district.

PYRIDINE.—90/140, 12s. to 17s. per gall. Nominal. Heavy, 7s. to 10s. per gall. 90/180, 8s. 6d. to 9s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. 6d. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—9½d. per lb. naked at works.

ANILINE SALTS.—9½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4d. to 4½d. per lb.

m-CRESOL 98/100%.—2s. 3d. per lb.

p-CRESOL 32/34° C.—2s. 3d. per lb.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—9d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 10s. to £10 per ton. Scarce. Grey, £17 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£9 to £10 per ton and upwards, according to grade and locality. Very scarce and in better demand.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. to 4s. per gall., 60% O.P. Solvent, 4s. 2d. to 4s. 3d. per gall, 40% O.P. Both scarce and in good demand

WOOD TAR.—£3 to £5 per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£41 10s. to £42 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic, Pure, 80%.—£39 per ton ex wharf London in glass containers.

Acid, Acetyl Salicylic.—2s. 5d. to 2s. 6d. per lb. Firm.

Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity.

Acid, Boric B.P.—Crystal, £43 per ton; powder, £47 per ton. Carriage paid any station in Great Britain, in ton lots.

Acid, Camphoric.—19s. to 21s. per lb.

Acid, Citric.—1s. 3½d. per lb., less 5%.

Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.

Acid, Pyrogallic, Crystals.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.

Acid, Salicylic, B.P.—1s. 3½d. to 1s. 4½d. per lb. Firm and good inquiry. Technical.—1s. to 1s. 0½d. per lb.

Acid, Tannic B.P.—2s. 9d. to 2s. 11d. per lb.

Acid, Tartaric.—1s. 0¼d. per lb., less 5%.

Amidol.—9s. 6d. per lb., d/d.

Acetanilide.—1s. 7d. to 1s. 8d. per lb. for quantities.

Amidopyrin.—11s. 6d. per lb.

Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity.

Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: lump, 1s. per lb.; powder, 1s. 3d. per lb.

Aspirin.—2s. 4d. to 2s. 5d. per lb. Steady demand.

Atropine Sulphate.—11s. per oz. for English make.

Barbitone.—8s. 9d. per lb.

Benzonaphthol.—3s. 3d. per lb. spot.

Bismuth Carbonate.—12s. 3d. to 14s. 3d. per lb.

Bismuth Citrate.—9s. 3d. to 11s. 3d. per lb.

Bismuth Salicylate.—10s. to 12s. per lb.

Bismuth Subnitrate.—10s. 6d. to 12s. 6d. per lb., all above bismuth salts, according to quantity.

Bismuth Nitrate.—6s. 9d. per lb.

Bismuth Oxide.—13s. 9d. per lb.

Bismuth Subchloride.—11s. 9d. per lb.

Bismuth Subgallate.—9s. 9d. per lb.

Borax B.P.—Crystal, £27 per ton; powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.

Bromides.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 2s. 2s. 2d. per lb.; ammonium, 2s. 2d. to 2s. 4d. per lb., all spot.

Calcium Lactate.—1s. 3½d. to 1s. 4½d.

Chloral Hydrate.—3s. 3d. to 3s. 6d. per lb., duty paid.

Chloroform.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

Creosote Carbonate.—6s. per lb.

Formaldehyde.—£39 per ton, in barrels ex wharf.

Guaiacol Carbonate.—6s. 6d. to 7s. per lb.

Hexamine.—2s. 4d. to 2s. 6d. per lb.

Homatropine Hydrobromide.—30s. per oz.

Hydrastine Hydrochloride.—English make offered at 120s. per oz.

Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.

Hydroquinone.—4s. per lb., in cwt. lots.

Hypophosphites.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

Iron Ammonium Citrate B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.

Iron Perchloride.—22s. per cwt., 112 lb. lots.

Magnesium Carbonate.—Light Commercial, £33 per ton net.

Magnesium Oxide.—Light Commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

Menthol.—A.B.R. recrystallised B.P., 18s. 9d. per lb. net; Synthetic, 11s. to 12s. per lb., according to quantity; Liquid (95%), 12s. per lb.; Detached Cryst., 15s. per lb.

Mercurials.—Red Oxide, 6s. 5d. to 6s. 7d. per lb., levig., 5s. 11d. to 6s. 1d. per lb.; Corrosive Sublimate, Lump, 4s. 8d. to 4s. 10d. per lb., Powder, 4s. 1d. to 4s. 3d. per lb.; White Precipitate, 4s. 10d. to 5s. per lb., Powder, 4s. 11d. to 5s. 1d. per lb., Extra Fine, 5s. 1d. to 5s. 2d. per lb.; Calomel, 5s. 3d. to 5s. 5d. per lb.; Yellow Oxide, 5s. 10d. to 5s. 11d. per lb.; Persulph, B.P.C., 5s. 1d. to 5s. 2d. per lb.; Sulph. nig., 4s. 10d. to 4s. 11d. per lb.

Methyl Salicylate.—1s. 9d. per lb.

Methyl Sulphonal.—15s. 6d. per lb.

Metol.—11s. per lb. British make.

Paraformaldehyde.—1s. 9d. per lb. for 100% powder.

Paraldehyde.—1s. 4d. per lb.

Phenacetin.—3s. 9d. to 4s. per lb.

Phenazone.—5s. 9d. to 6s. per lb.

Phenolphthalein.—3s. 9d. to 4s. per lb.

Potassium Bitartrate 99/100% (Cream of Tartar).—81s. per cwt., less 2½% for ton lots.

Potassium Citrate.—1s. 11d. to 2s. 2d. per lb.

Potassium Ferricyanide.—1s. 9d. per lb., in cwt. lots.

Potassium Iodide.—16s. 8d. to 17s. 2d. per lb., according to quantity.

Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

Potassium Permanganate.—B.P. crystals, 6½d. per lb., spot.

Quinine Sulphate.—2s. per oz., 1s. 8d. to 1s. 9d. per oz. in 100 oz. tins.

Resorcin.—4s to 4s. 3d. per lb., spot.

Saccharin.—55s. per lb.

Salol.—3s. to 3s. 3d. per lb.

Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb.

Sodium Citrate, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb. B.P.C., 1923—2s. 1d. to 2s. 2d. per lb. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.

Sodium Ferrocyanide.—4d. per lb. carriage paid.

Sodium Hyposulphite, Photographic.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

Sodium Nitroprusside.—16s. per lb.

Sodium Potassium Tartrate (Rochelle Salt).—80s. to 90s. per cwt., according to quantity.

Sodium Salicylate.—Powder, 1s. 10d. to 1s. 11d. per lb. Crystal, 1s. 11d. to 2s. per lb.

Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.

Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

Sulphonal.—10s. 6d. per lb.

Tartar Emetic, B.P.—Crystal or powder, 2s. to 2s. 2d. per lb.

Thymol.—11s. to 14s. 3d. per lb., according to quantity.

Perfumery Chemicals

Acetophenone.—10s. per lb.

Aubepine (ex Anethol).—12s. per lb.

Amyl Acetate.—2s. per lb.

Amyl Butyrate.—5s. 6d. per lb.

Amyl Salicylate.—3s. per lb.

Anethol (M.P. 21/22° C.).—6s. per lb.

Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 3d. per lb.

Benzyl Alcohol free from Chlorine.—2s. 3d. per lb.

Benzaldehyde free from Chlorine.—2s. 9d. per lb.

Benzyl Benzoate.—2s. 6d. per lb.

Cinnamic Aldehyde Natural.—18s. per lb.

Coumarin.—11s. per lb.

Citronellol.—15s. per lb.

Citral.—9s. 6d. per lb.

Ethyl Cinnamate.—10s. per lb.

Ethyl Phthalate.—3s. per lb.

Eugenol.—9s. 9d. per lb.

Geraniol (Palmarosa).—19s. per lb.

Geraniol.—6s. to 10s. 6d. per lb.

Heliotropine.—4s. 10d. per lb.

Iso Eugenol.—13s. 6d. per lb.

Linalol.—Ex Shui Oil, 12s. per lb. Ex Bois de Rose, 17s. per lb.

Linalyl Acetate.—Ex Shui Oil, 15s. per lb. Ex Bois de Rose, 18s. 6d. per lb.

Methyl Anthranilate.—9s. 3d. per lb.

Methyl Benzoate.—4s. 6d. per lb.

Musk Ketone.—36s. per lb.

Musk Xylol.—8s. 6d. per lb.

Nerolin.—3s. 9d. per lb.

Phenyl Ethyl Acetate.—12s. per lb.

Phenyl Ethyl Alcohol.—10s. per lb.

Rhodinol.—28s. 6d. per lb.

Safrol.—1s. 6d. per lb.

Terpineol.—1s. 6d. per lb.

Vanillin.—19s. 6d. per lb.

Essential Oils

Almond Oil.—11s. 6d. per lb.

Anise Oil.—3s. 6d. per lb.

Bergamot Oil.—31s. 6d. per lb.

Bourbon Geranium Oil.—12s. per lb.

Camphor Oil.—63s. 6d. per cwt.

Cananga Oil, Java.—20s. per lb.

Cinnamon Oil, Leaf.—5½d. per oz.

Cassia Oil, 80/85%.—8s. 9d. per lb.

Citronella Oil.—Java, 85/90%, 2s. 4d. per lb. Ceylon, pure, 2s. 1d. per lb.

Clove Oil.—6s. 9d. per lb.

Eucalyptus Oil, 70/75%.—2s. per lb.

Lavender Oil.—French 38/40%, Esters, 21s. per lb.

Lemon Oil.—9s. per lb.

Lemongrass Oil.—4s. 6d. per lb.

Orange Oil, Sweet.—9s. 9d. per lb.

Otto of Rose Oil.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.

Palma Rosa Oil.—9s. 9d. per lb.

Peppermint Oil.—Wayne County, 28s. 6d. per lb. Japanese, 9s. 6d. per lb.

Petitgrain Oil.—8s. 3d. per lb.

Sandalwood Oil.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, December 9, 1926.

THE turnover in chemicals generally has been better during the past week, and confidence is developing daily. Prices on the whole are very firm. Export demand is quiet.

General Chemicals

ACETONE is lower in price at £63 per ton.
ACID ACETIC is in active demand on both home trade and export account. Prices unchanged.
ACID CITRIC is lifeless; price nominally 1s. 2½d. per lb.
ACID FORMIC in fair demand, price unchanged.
ACID LACTIC is unchanged at £45 per ton for 50% by weight.
ACID OXALIC is in improved demand at 3⅝d. per lb. to 3¾d. per lb.
ACID TARTARIC is very quiet; price nominally 11½d. per lb.
ALUMINA SULPHATE is in good inquiry at about £5 10s. per ton for 17–18%.
AMMONIUM CHLORIDE is very quiet; price £18 10s. per ton.
BARIUM CHLORIDE is slow at about £9 10s. per ton.
COPPER SULPHATE is in fair inquiry; price firm at £25 to £25 10s. per ton.
CREAM OF TARTAR.—The advance in price has been fully maintained. Market to-day is £76 per ton.
EPSOM SALTS.—Unchanged at £5 10s. per ton.
FORMALDEHYDE.—Offering at £43 to £44 per ton; very scarce for early delivery.
LEAD ACETATE is a good market and is quoted at £44 to £45 per ton for white, and about £2 per ton less for brown.
METHYL ACETONE is firm at £58 to £65 per ton, according to quality.
METHYL ALCOHOL.—Quieter at £46 to £48 per ton.
POTASH CHLORATE is slow at 3½d. per lb.
POTASH PERMANGANATE is a little easier at 7½d. per lb. for B.P.
POTASH PRUSSIATE is firm at 7½d. per lb. Any improvement in demand would indicate a higher price.
SODA ACETATE is quiet; price is firm at £20 to £25 per ton.
SODA BICHROMATE.—The English makers have reduced their price for next year to 3¼d. per lb. less 5% for contracts.
POTASH BICHROMATE.—The English makers' price for next year is 4½d. per lb., less 5% discount for contracts.
SODA CHLORATE is easier at 3¼d. per lb. owing to second-hand realisations.
SODA NITRITE.—Unchanged at £20 per ton.
SODA PHOSPHATE is a firm market at £13 10s. to £14 per ton.
SODA PRUSSIATE is in good request; price is firm at 4⅜d. per lb.
SODA SULPHIDE is again higher in price, and is quoted £11 to £11 10s. per ton for high-grade material.
ZINC SULPHATE.—Unchanged.

Coal Tar Products

There is no great change to report in the market for coal tar products from last week.

90's BENZOL is quoted at 2s. 1d. per gallon on rails, while the motor quality is quoted at 1s. 11½d. to 2s. per gallon.
PURE BENZOL is worth from 3s. 9d. to 4s. per gallon.
CREOSOTE OIL is unchanged at 7¾d. to 8d. per gallon, on rails in the country, while the price in London is from 8¾d. to 9d. per gallon at works.
CRESYLIC ACID is quoted at 2s. 2d. per gallon on rails for the pale quality 97/99%, while the dark quality 95/97% is worth 2s. 1d. per gallon.
SOLVENT NAPHTHA is worth about 1s. 10d. per gallon on rails.
HEAVY NAPHTHA is unchanged at 1s. 6d. to 1s. 7d. per gallon on rails.
NAPHTHALENES are also unchanged, the 76/78 quality being quoted at £8 to £9 per ton, while the 74/76 quality is worth about £8 to £8 5s. per ton, at makers' works.
PITCH.—The market is erratic and prices varying from 150s. to 200s. per ton, f.o.b. U.K. port are being quoted.

Latest Oil Prices

LONDON.—LINSEED OIL quiet at 2s. 6d. decline. Spot, £31 15s., ex mill; December, £30 15s.; January and January-April, £31; May-August, £30 17s. 6d. RAPE OIL slow. Crude, extracted, £45 10s.; technical, refined, £47 10s. ex wharf. COTTON OIL steady. Refined common edible, £38; Egyptian, crude, £31 10s.; deodorised, £40. TURPENTINE quiet and 6d. per cwt. lower. American, spot, 60s. 9d.; January-April and May-August, 62s. 3d.

HULL.—December 8.—LINSEED OIL, spot and December, £31 10s.; January-April, £31 12s. 6d.; May-August, £31 7s. 6d. COTTON OIL, Bombay, crude, £30; Egyptian, crude, £31; technical, £34 10s.; deodorised, £37. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £39. GROUNDNUT OIL.—Crushed/extracted, £43; deodorised, £47. SOYA OIL.—Extracted and crushed, £34 10s.; deodorised, £47. RAPE OIL.—Crude/extracted, £45 10s.; refined, £47 10s. per ton, net cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Calcium Cyanamide

INQUIRIES for spring delivery are now becoming more numerous and a number of orders have been placed for the early months of the year. The price, £9 10s. per ton carriage paid in 4 ton lots to any railway station in Great Britain, representing 10s. per unit of nitrogen, is proving attractive to buyers.

Nitrogen Products

EXPORT.—During the past week there has been no change in the export position, except that British producers are accepting orders for smaller and smaller quantities as the consuming season becomes nearer. The price remains at £11 5s. per ton f.o.b. U.K. port in single bags. Reports from America and the Continent indicate that merchants are beginning to cover their spring requirements.

HOME.—Merchants continue to book their seasonal requirements in certain districts. Some of the collieries will be at work before Christmas, and all anxiety regarding home supplies should soon be dissipated. The recent rise in price of 5s. per ton seems to have had a negligible effect upon demand, no doubt because the difference in parity price between nitrate and sulphate remains considerable and supplies of nitrate of lime seem likely to be very small.

NITRATE OF SODA.—The nitrate position continues to show slight improvement. Total sales by the Chilian Producers' Association now show a deficit of less than 900,000 tons compared with the same period last year. These figures should be reduced considerably as the consuming season becomes nearer. Nevertheless, it seems clear that lower prices operating for synthetic ammonia products will cause a large carry over of nitrate.

Sextone and Sextone "B": Reduced Prices

HOWARDS AND SONS, LTD., of Ilford, notify us of a reduction in the prices of Sextone (cyclohexanone) and Sextone "B" (methyl cyclohexanone). The cyclohexanols and their derivatives are preparations of very great and increasing importance as solvents of nitrocellulose, gums, resins, etc., and their appearance on the market is rapidly revolutionising the paint, lacquer, and varnish, etc., trades. The manufacturers claim that the reduced price of Sextone "B" makes it the cheapest medium-boiling nitrocellulose solvent on the market to-day, quite apart from its higher solvent power and other advantages. The following particulars should be useful for purposes of comparison:—

Sextone (cyclohexanone). A colourless mobile liquid. Boiling point 154°-156° C. Density 0·95. Flash point 117° F. Ketone content 80/90 per cent.

Sextone "B" (methyl cyclohexanone). A colourless mobile liquid. Boiling point 160°-170° C. Density 0·93. Flash point, 130° F. Ketone content, 80/90 per cent.

Samples will be sent free on application to the manufacturers, Howards and Sons, Ltd., Ilford, near London.

Chemical Bleaching of Flour

THE Departmental Committee of the Ministry of Health appointed to inquire into the alleged harmful effects of the "improving" and bleaching of flour has embodied its findings in a draft report which is being considered in detail by the committee. It is stated that, although the recommendations of the committee are not in final shape, and will not be so for some weeks, it is now definitely ascertained that their researches, which have covered a very wide field, including special practical work at one of the leading universities, do not corroborate the alarmist views which have been ventilated on this subject. In fact, only one of the many processes of flour "improvement" has been definitely singled out as potentially harmful. The milling and baking industries, which have been following the inquiry with the closest attention, have been led to believe that the committee's findings and recommendations to the Government will be by no means such as will involve any great revolution in milling methods.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, December 8, 1926.

THE heavy chemical market has been fairly active during the past week, and English manufacturers have now advised one or two changes in prices operating from January 1 next. Continental products remain steady.

Industrial Chemicals

ACID ACETIC, 98/100%.—£55 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 to £38 per ton; 80% technical, £37 to £38 per ton, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flakes, £37 per ton; powdered, £39 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In good demand and price unchanged at 7¼d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at 1s. 3d. per lb., less 5% ex store, with demand poor. Quoted 1s. 2⅞d. per lb. less 5% ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—In moderate demand and price unchanged at about 3¾d. per lb., ex store, spot delivery. Quoted 3½d. per lb., c.i.f. U.K. ports, prompt shipment from the Continent.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In moderate demand and price unchanged at about 11¼d. per lb., less 5%, ex store, spot delivery. Offered for prompt shipment at about 11⅛d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material on offer at about £6 per ton, ex store. Quoted £5 8s. 6d. per ton, c.i.f. U.K. ports. Prompt shipment from the Continent.

ALUM, LUMP POTASH.—Rather higher quotations from the Continent. Lump quality now quoted £8 per ton, c.i.f. U.K. ports. Crystal powder, about £7 15s. per ton, c.i.f. U.K. ports. Lump material offered on spot at £9 2s. 6d. per ton, ex store. Crystal powder £8 10s. per ton, ex store.

AMMONIA ANHYDROUS.—Imported material selling at about 11¼d. to 11½d. per lb., ex wharf, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2¼d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers crystals of British manufacture, £23 10s. to £25 10s. per ton, ex station. Continental make on offer at £21 5s. per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £18 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material quoted £19 10s. per ton, ex store; offered for early delivery at £18 15s. per ton, ex wharf.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals offered from the Continent at about £8 2s. 6d. per ton, c.i.f. U.K. ports. Spot material now quoted £9 15s. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—English manufacturers advise a reduction of 10s. per ton on deliveries from January 1 next. Spot material now £9 per ton, ex station; contracts 20s. per ton less. Continental on offer at about £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals £23 per ton; powdered £24 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or at £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—English material unchanged at about £23 5s. per ton, f.o.b. U.K. ports. Continental on offer at £22 10s. per ton, ex wharf.

FORMALDEHYDE, 40%.—Spot material on offer at £40 per ton, ex store. Quoted £38 per ton, c.i.f. U.K. ports, prompt shipment.

GLAUBER SALTS.—English material quoted £4 per ton, ex store or station. Continental on offer at about £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £36 15s. per ton, ex store.

LEAD, WHITE.—Quoted £37 5s. per ton, ex store.

LEAD, ACETATE.—Rather higher quotations from the Continent. White crystals now quoted £44 5s. per ton, c.i.f. U.K. ports. Brown on offer at £40 10s. per ton, c.i.f. U.K. ports. White crystals on spot at about £45 per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH CAUSTIC, 88/92%.—Syndicate price £29 15s. per ton, c.i.f. U.K. ports, minimum 15 ton lots. Liquid 50° now quoted £14 per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store. 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Rather cheaper quotations from the Continent. Powdered quality now quoted £24 10s. per ton, c.i.f. U.K. ports. Crystals £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—Quoted £22 per ton, c.i.f. U.K. ports. Prompt shipment from the Continent. Spot material about £24 per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Now on offer at 6¾d. per lb., ex store, spot delivery. Quoted 6½d. per lb. ex wharf, early shipment.

POTASSIUM PRUSSIATE, YELLOW.—In good demand. Spot material advanced to about 7⅞d. per lb., ex store. Quoted 7⅛d. per lb., ex wharf, prompt shipment from the Continent.

SODA CAUSTIC.—76/77%, £17 10s. per ton; 70/72%, £16 2s. 6d. per ton. Broken 60%, £16 12s. 6d. per ton. Powdered, 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. station, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—English material quoted £22 10s. per ton, ex store. Continental on offer at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Prices for spot delivery unchanged at 3½d. per lb. delivered. Manufacturers advise a reduction of ¼d. per lb. as from January 1 next.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, £1 7s. 6d. per ton more; alkali 59%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 per ton, ex station, minimum 4 ton lots; pea crystals, photographic quality, £14 10s. per ton, ex store, spot delivery. Continental commercial crystals quoted £8 15s. per ton, ex store.

SODIUM NITRATE.—Ordinary quality quoted about £12 12s. 6d. per ton, ex store. Refined quality 5s. per ton extra.

SODIUM NITRITE 100%.—£21 5s. per ton, ex store, spot delivery.

SODIUM PRUSSIATE (YELLOW).—Quoted 4¼d. per lb. ex store, spot delivery. Still in good demand. Offered for prompt shipment from the Continent at 4½d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Prices for home consumption, £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE, 60/62%.—Solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 3d. per ton—all delivered buyers' works U.K. minimum 5 ton lots with slight reduction for contracts; 60/62%, solid quality offered from the Continent at about £8 15s. per ton c.i.f. U.K. ports. Broken quality 15s. per ton more. Crystals, 30/32%, about £6 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £11 15s. per ton; roll, £10 10s. per ton; rock, £10 10s. per ton; floristella, £10 per ton; ground American, £9 5s. per ton, ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material 98/100% quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental make on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

R. SALT.—2s. 3d. per lb. per 100%. Some inquiries.
G. SALT.—2s. 3d. per lb. per 100%. Some inquiries.
BETA NAPHTHOL.—11d. to 1s. per lb. Some inquiries.
BENZOIC ACID.—1s. 8½d. per lb. Some inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, December 9, 1926.

A quietly steady business continues to be done on the Manchester market in several lines, but, for the most part, the demand for chemicals is on a low level. As the remainder of the month is normally a quiet period even in the best of times there can be little hope of an extension of buying operations until January is well advanced. By that time there should be some settling down in those industries that have been sufferers through the prolonged coal stoppage. As usual there has been a number of alterations in prices, but with one exception they have been minor fluctuations.

Heavy Chemicals

There has been a moderate call for prussiate of soda and as offers of this product are still rather limited values keep steady at about 4½d. per lb. For hyposulphite, however, current demand is restricted, although prices are maintained at £9 10s. per ton for the commercial material and £15 10s. for the photographic. Sulphide of sodium also remains rather slow, with 60–65 per cent. concentrated solid on offer at £9 10s. to £10 and commercial at £7 5s. per ton. Glauber salts are about unchanged on the week at £3 15s. per ton with demand on the quiet side. There is only a moderate call for saltcake, which is quoted at about £3 5s. per ton. Bichromate of soda is maintained at 3¼d. per lb. and a fair inquiry for this material is reported. For nitrite of soda there is a quietly steady demand and values keep up, about £19 10s. per ton being asked. Caustic soda is well held and business is on steady lines, with quotations ranging from £17 10s. per ton for 76 per cent. down to £15 2s. 6d. for 60 per cent. Bleaching powder is being called for in moderate quantities at about £8 10s. per ton. In the case of phosphate of soda there is not much inquiry and a certain amount of easiness, prices hovering round £12 15s. per ton. Chlorate of soda is quiet but unchanged on the week at 3d. per lb. Alkali is in steady request with values maintained at about £6 15s. per ton. Bicarbonate of soda is being quoted to-day at £10 10s. per ton, with demand on moderate lines.

The most interesting movement in the potash section during the past week has been the advance in solid caustic, current values at round £30 per ton being about £3 higher than formerly. Carbonate of potash, however, so far is unchanged at £26 5s. to £26 10s. per ton, and a fair volume of inquiry is coming through. Permanganate of potash is quiet, but quotations are rather steadier than they have been recently with B.P. quality quoted at about 6⅝d. per lb. and commercial material at 5d. Chlorate of potash also seems to have acquired some additional strength, with current prices at about 3½d. per lb. With supplies still on the short side yellow prussiate of potash is firmer at 7¼d. to 7½d. per lb., with bichromate of potash for the same reason well held at 4⅛d. per lb.

Possibly in sympathy with recent movements in the metal there has been a slight easing in the case of the lead compounds, with lead nitrate at £40 to £40 10s. per ton, and acetate of lead in quiet demand at about £41 per ton for the brown and from £44 10s. to £45 for the white. There is not much call for white acetate of lime, but prices are steady at £17 5s. per ton, with brown still very firm at £9 per ton. Sulphate of copper continues to meet with a fair amount of inquiry with quotations maintained at £23 15s. per ton, f.o.b. Arsenic is also well held although there is not a great deal of actual business stirring; white powdered, Cornish makes, still commands up to £16 10s. per ton at the mines.

Acids and Tar Products

The demand for acetic acid is rather quiet, but at £37 10s. per ton for 80 per cent. commercial and £66 for glacial prices are steady. Oxalic acid is in moderate request at about 3⅝d. per lb. For citric acid inquiry has continued slow, but quotations are held at 1s. 3¼d. per lb. Tartaric acid has been in quiet demand at round 11½d. per lb.

With supplies still short there has been little actual business done in the by-products. Creosote oil has not altered much from last week, quotations for this being about 8¼d. per gallon, whilst for pitch current f.o.b. prices are round £7 10s. per ton. Carbolic acid crystals remain firm at 7d. per lb., with about 1s. 10d. per gallon being quoted for solvent naphtha.

Retirement of Professor Turner

Professor Thomas Turner, who has retired from the Chair of Metallurgy in the University of Birmingham, was the recipient, on Friday, December 3, of presentations from past and present students, colleagues, and friends. He received a framed photograph of himself, which will hang permanently in the Metallurgical Department at Edgbaston, a bound volume containing the names of the subscribers and an expression of appreciation of his services to metallurgy, and a Wolseley motor car. Professor Turner is a past president of the Institute of Metals, and the first Feeney Professor of Metallurgy in the University; and the high distinctions bestowed upon him include the award of the Bessemer gold medal of the Iron and Steel Institute. Mr. Neville Chamberlain, M.P. (Minister of Health), having read and signed the address, handed it to Professor Turner. Mr. Chamberlain recalled his student days at Mason College nearly forty years ago, when he first met Professor Turner, then lecturer in metallurgy. Tributes to Professor Turner were also paid by Mr. Grant Robertson, principal of the University, Dr. Ingall, Dr. T. B. Crow, Dr. O. F. Hudson, Mr. E. M. Boote, and Mr. A. Spittle. Acknowledging the presentations and speeches, Professor Turner referred to the fact that Mr. Baldwin had also been a student in the metallurgical department.

Relative Efficiency of Grinding Media

At a meeting of the Bristol Section of the Society of Chemical Industry, Dr. G. Martin read a paper on "The Relative Efficiency of the Grinding Media Employed in Ball and Tube Mill Grinding," in the course of which he pointed out the need of rigorously defining in engineering units what was meant by the efficiency of a grinding machine, which he himself defined as the work performed by the machine in foot-lb. in increasing the surface of standard Leighton Buzzard sand by one square foot. By methods he had worked out, he showed how to estimate the surface of the sand. For the first time it was now possible quantitatively to compare the efficiency of different grinding machines. He showed that the absolute grinding efficiency of machines could be calculated from the heat of volatilisation of brittle crystals and their molecular dimensions. Experiments on these lines proved that the work done in grinding was proportional to the surface produced, this being a statistical result similar to the law of extension of liquid films. The most efficient media were ¾ inch steel balls, followed by one inch steel balls; flints were extremely inefficient.

British Association Meeting, 1927

The 1927 meeting of the British Association for the Advancement of Science will take place in Leeds; beginning on August 31, and extending over eight days, under the presidency of Sir Arthur Keith. Textile matters from the scientific point of view will figure largely in the discussions, and fuel will also be discussed. The officials of the various sections have been appointed, the president of the chemistry section being Dr. N. V. Sidgewick, F.R.S., of Oxford, while the local secretary of the section is Mr. H. S. Patterson, of the University of Leeds.

Brigadier-General Sir William Alexander is expected to arrive this week on his return from New York.

The museum and laboratories of the Wellcome Bureau of Scientific Research, Endsleigh Gardens, London, were reopened on Wednesday by the Rt. Hon. Neville Chamberlain, Minister of Health.

Mr. Harold Nielsen, who has been in America, attending the recent International Conference on Bituminous Coal, has returned to England. Dr. C. H. Lander and various other delegates will return shortly.

The inquest on John Randall Davies, chemical process worker, whose death was the second fatality occurring in connection with the explosion at the Ing's Lane Chemical Works, Castleford, on November 22, was resumed on Wednesday, December 1, in Leeds, when a verdict of "Accidental Death" was returned. Dr. Watts, of the Explosives Department of the Home Office, in reply to the coroner, said that little was known by the Explosives Department about the explosive properties of sodium dinitrophenate. Experiments were being made with it. He thought that if ignited it would probably explode.

Company News

ANGLO-AMERICAN OIL CO.—The directors announce an interim dividend of 1s. 6d. per share.

BROUGHTON COPPER CO.—An interim dividend of 5 per cent. actual is announced on the ordinary shares, less tax.

UNITED INDIGO AND CHEMICAL CO.—The company announce an interim dividend at the rate of 5 per cent. per annum, less tax at 4s. on the ordinary shares, payable on December 31.

NOBEL INDUSTRIES, LTD.—An interim dividend at the rate of 3 per cent. (actual), less income tax, on the ordinary shares is payable on January 1. A similar interim distribution was announced at this time last year.

PINCHIN, JOHNSON AND CO.—The directors have resolved that the usual dividend at the rate of 6½ per cent. per annum, less tax, on the preference shares for the six months to December 31, be paid on January 1.

AMERICAN CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD.—The directors have declared a dividend of 3½ per cent. on the 7 per cent. cumulative first participating preferred stock of the company, payable on December 31.

BRITISH METAL CORPORATION, LTD.—At an extraordinary general meeting held in London on Wednesday, the special resolutions providing for a rearrangement of the capital of the company were approved. (See THE CHEMICAL AGE, December 4, Metallurgical Section, page 44.)

ELECTROLYTIC ZINC OF AUSTRALASIA.—The net profits for the year ended June 30 amounted to £420,699, and £165,932 was brought forward. Dividends (Nos. 8 and 9) absorbed £311,845, and it is proposed to add to the equalisation reserve £40,000, to write off research and development account £20,000, appropriate for new plant £20,000, and to add to the debenture sinking fund reserve £12,100, leaving £182,686 to carry. Since the close of the year dividend No. 10 on all preference and ordinary shares has been paid.

WEARDALE STEEL, COAL AND COKE CO., LTD.—For the year ended September 30 last, the profit, including interest on investments and after providing for all accrued liabilities, is £56,374, as compared with £106,167 last year. There was brought forward £64,873, making a total amount of £121,247. After allowing for the year's dividend on the preferred ordinary, the directors recommend a dividend of 6 per cent. per annum on the deferred ordinary shares for the year, placing to reserve account for general purposes, including depreciation, £20,000, and carrying forward £46,255. The annual meeting will be held at Newcastle-upon-Tyne on December 16 at 12 noon.

Tariff Changes

MEXICO.—The Mexican *Diario Oficial* for October 15 contains a Presidential Decree, dated October 6 and effective twenty days after publication, which revises a number of headings in the Mexican export tariff. Particulars are given regarding sodium salts not specified in the tariff, talc, and mica. The *Diario Oficial* for October 19 contains a Decree dated October 6 and effective thirty days after publication, which revises certain headings of the Mexican import tariff. Particulars are given regarding alumina and emery, crude alabaster, lava, marble, pumice stone, plaster, and gypsum.

MOZAMBIQUE (PORTUGUESE EAST AFRICA).—Respecting the value of goods subject to *ad valorem* duties on import into Mozambique, it should be noted that the provisions of the Decree referred to in the *Board of Trade Journal* of September 23 have been considerably modified by further Decrees of September 11 and October 16. The Decrees also make some slight alterations in the tariff regarding industrial and mining machines, apparatus and instruments and parts thereof, and chemical products not specified in the tariff.

POLAND.—It should be noted that in virtue of an Order dated October 30, 1926, the reduction of 80 per cent. of the Customs duty, which has hitherto been accorded to machinery and apparatus of kinds not manufactured in Poland and forming a component part of newly installed complete equipment of industrial establishments, will now be accorded also to such machinery imported into Poland for the purpose of reducing the costs or increasing the volume of industrial or agricultural production.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to January 1, 1927.

"DURAXALIN."

467,230.—Class 1. For lacquers for metal. Gedge and Co., 88, St. John Street, London, E.C.1; manufacturing chemists, February 16, 1926. (To be Associated. Sect. 24.)

"SYNTHOS."

473,283.—Class 2. Disinfectants, deodorisers and insecticides. Class 2. Murphy and Son, Ltd., The Cedars, Sheen Lane, Mortlake, London, S.W.14; technical chemists. September 23, 1926. (To be Associated. Sect. 24.)

"SYMDA."

474,071.—Class 2. Phosphates for use as fertilisers. Phosphates de Saint-Symphorien Société Anonyme (a Joint Stock Company organised under the laws of Belgium), 67, Rue Chaussée Saint-Symphorien, near Mons, Belgium; manufacturers. October 21, 1926.

"CASOSIL."

473,966.—Class 3. Chemical substances prepared for use in medicine and pharmacy. Johann Abraham von Wulfing, 231, Friedrichstrasse, Berlin, W., Germany; manufacturing chemist. October 18, 1926.

"GLYSCARA."

474,131.—Class 3. Chemical substances prepared for use in medicine and pharmacy. T. and H. Smith, Ltd., Blanfield. Chemical Works, Wheatfield Road, Edinburgh; manufacturing chemists. October 22, 1926.

"PETRISIL."

473,335.—Class 4. Bleaching earth, for use in manufactures. Petri Brothers, Ltd., 24, Minories, London, E.1; chemical merchants. September 24, 1926.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

GLASSWARE, PATENT MEDICINES, ETC.—A firm of import and export merchants in London, who have just appointed an agent in Egypt, are desirous of representing British manufacturers. (Reference No. 671.)

ALUMINIUM WARE AND TOOLS OF TRADE.—A firm of manufacturers' agents in Sydney desire to secure the representation of British manufacturers. (Reference No. 653.)

SOYA BEAN OIL, ETC.—A firm of manufacturers' agents in British Guiana working on a commission basis desire to obtain the representation of exporters. (Reference No. 657.)

AGENT'S SERVICES OFFERED.—The managing director of old-established general export merchants shortly proceeding on a visit to the company's representatives in the Argentine, Brazil, and other parts of South America, is prepared to undertake one or two additional representations of first-class manufacturers; also personally to investigate and report upon market requirements, etc. (Reference No. 673.)

Dye Imports into United States

IMPORTS of coal tar dyes during September reached a total of 387,533 lb., valued at $322,466, against 380,414 lb., valued at $298,159 in August, and 298,858 lb., valued at $285,642 in September, 1925. For the first nine months of this year the amount imported was 3,440,246 lb., valued at $3,084,095, as compared with 3,553,532 lb., valued at $3,310,464, for the corresponding period in 1925. The percentage of dyes by country of shipment was as follows for September (figures in brackets indicate figures for August):—Germany, 50 (47); Switzerland, 30 (34); France, 3 (2·5); England, 5 (0·5); Belgium, 3 (5·5); Canada, 7 (8·5); Italy, 2 (2).

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

GARDNER, Charles Richard, 8, Old Tram Road, Albion Street, Gloucester, analytical chemist. (C.C., 11/12/26) £16 16s. 9d. November 2.

GIBBS, Henry Albert, Gibbs Oil Products, Ltd., Roebuck Street, West Bromwich. (C.C., 11/12/26.) £57 18s. October 27.

LOVEDAY, J. A., Hillside, Denby Dale, perfumery manufacturer. (C.C., 11/12/26.) £14 15s. 6d. November 2.

WOOLF, S., 16, St. George's Terrace, Leeds, soap manufacturer. (C.C., 11/12/26.) £15 18s. 5d. October 22.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

COCKROFT (FRED) LTD., Leeds, manufacturing chemists. (M., 11/12/26.) Registered November 25, £12,000 debentures; general charge. *Nil. November 7, 1925.

MELMIL, LTD., Southend-on-Sea, owners of a secret process for production of mercury, etc. (M., 11/12/26.) Registered November 20, £900 Land Registry charge, to Mrs. L. Levy, Fleetwood House, High Road, Laindon Hills, charged on Bridge Mills, Little Burstead.

NATIONAL MANUFACTURING AND TRADING CO., LTD., Cardiff, perfumery manufacturers. (M., 11/12/26.) Registered November 20, £400 debentures to Mrs. R. Thomas, 23, Bendrick Road, Barry; general charge.

REYNOLDS AND BRANSON, LTD., Leeds, chemists. (M., 11/12/26.) Registered November 24, £23,000 further charge (inclusive of £17,500 secured by deed dated November 19, 1923), to W. S. Hannam, City Chambers, Leeds, solicitor, and another; charged on properties in Briggate, Leeds, etc. *£32,464. June 24, 1926.

Receiverships

BRITISH OXIDES, LTD. (R., 11/12/26.) J. H. Bateman, of Waterloo Street, Swansea, auctioneer and estate agent, was appointed receiver on November 25, 1926, under powers contained in debenture dated April 16, 1925.

BRUMFITT (R.) AND CO., LTD. (R., 11/12/26.) J. Lund, of City Chambers, 2, Darley Street, Bradford, Incorporated Accountant, was appointed receiver and manager on November 17, 1926, under powers contained in debenture dated February 27, 1914.

COLNBROOK CHEMICALS AND EXPLOSIVES CO., LTD. (R., 11/12/26.) H. Holl, of 15, Upper King Street, Norwich, ceased to act as receiver or manager on November 24, 1926.

London Gazette, &c.

Winding Up Petition

FLOROGEN CO., LTD. (W.U.P., 11/12/26.) A creditor's winding up petition has been presented by C. R. Goodbody, of Watford, perfumery merchant, and is to be heard at the Royal Courts of Justice, Strand, London, on December 21.

Companies Winding Up

ASSOCIATED PERFUMERS, LTD.. Meetings of creditors, December 16, 11.30 a.m., and contributories, December 16, 12, noon, 33, Carey Street, Lincoln's Inn, London, W.C.2.

KATHIJAX, LTD. Meetings of creditors, December 17, 11.30 a.m., and contributories, December 17, 12 noon, 33, Carey Street, Lincoln's Inn, London, W.C.2.

Bankruptcy Information

GIBBS, H. A. (Male), 9, John Street, Lozells, Birmingham, oil and chemical importer and refiner. (R.O., 11/12/26.) Receiving order, November 30. Creditor's petition.

Notice of Intended Dividend

PICKLES, Robert Henry, trading as R. H. PICKLES AND CO., Prussiate Works, (also known as Manganese Mills), Droylsden, Manchester, chemical manufacturer. Last day for receiving proofs, December 21. Trustee, A. Yearsley, 27, Brazennose Street, Manchester.

New Companies Registered

EUROPEAN PYRITES CORPORATION, LTD. Registered as a "private" company on December 2. Nom. capital of £50,000 in £1 shares (2,500 "A," 2,500 "B" and 45,000 ordinary). The objects are to acquire, crush, win, get, quarry, smelt, calcine, refine, dress, amalgamate, manipulate, and prepare for market and deal in ores, metals, and mineral substances of all kinds, and, in particular, sulphur, copper and iron, and ores containing sulphur, copper and iron, and to carry on any metallurgical or chemical operations in the United Kingdom, or elsewhere, etc. A subscriber: A. K. Sterne, 18, Austin Frairs, London, E.C.2. Solicitors: Slaughter and May, 18, Austin Friars, London, E.C.2.

IMPERIAL CHEMICAL INDUSTRIES, LTD., Broadway Buildings, 50–64, Broadway, London, S.W.1. Registered as a "public" company on December 7. Nom. capital, £65,000,000 in 47,320,000 shares of £1 each and 35,360,000 shares of 10s. each. The objects are to acquire the whole or part of the shares, debentures, etc., in Brunner Mond and Co., Nobel Industries, the United Alkali Co., and the British Dyestuffs Corporation, and to carry on the business of manufacturers of and dealers in chemicals, dyes, explosives, metals, fertilisers, kieselguhr nitrates and other chemical substances, owners of quarries and coal, copper and other mines and oil deposits; fixers of atmospheric nitrogen by the synthetic ammonia or other process, etc. Directors: Sir Alfred Mond, M.P., Sir Harry D. McGowan, Lord Ashfield, Sir J. F. Brunner, Dr. G. C. Clayton, M.P., H. J. Mitchell, H. Mond, Sir Max Muspratt, J. G. Nicholson, Lt.-Col. G. P. Pollitt, D.S.O., The Marquis of Reading, Sir Josiah C. Stamp, E. Todhunter. Remuneration: £2,000 each per annum and half of 1 per cent. of the net profits, divided between them (other than a managing director receiving special remuneration).

THE MARINE CELLULOSE SYNDICATE, LTD. Registered December 7 as a "private" company with a nom. capital of £10,500 in 10,000 "A" shares of £1 and 10,000 "B" shares of 1s. To treat vegetable substances, pulp and fibre for making cellulose and its derivatives; to carry on any chemical and other research work in connection therewith; manufacturers of paper, boards and other articles involving the use of cellulose, and materials used in the manufacture and treatment of the same; bleachers, dyers, and packing material manufacturers. A subscriber: Lt.-Col. R. H. F. Standen, United Service Club, London, S.W.

ORIENTAL INDUSTRIAL MONOPOLIES, LTD., 67, Basinghall Street, E.C.2. Registered as a "public" company on December 1. Nom. capital of £157,500 in 150,000 preferred shares of £1 and 150,000 deferred shares of 1s. To acquire shares, stocks, etc., of any company constituted or carrying on business in Turkey or elsewhere for the manufacture of explosives or other like commodities, and to carry on business of manufacturers, buyers and sellers of and dealers in explosives, etc. Directors: P. Motet, 4, Rue Chambiges, Paris, A. G. Gibson, and E. J. Wilson.

SCIENTIFIC RESEARCH, LTD., 52, Bedford Square, London, W.C. Registered December 6. Nom. capital, £10,500 in 2,000 10 per cent. cumulative preference shares of £5 each and 10,000 ordinary shares of 1s. each. Engineers, consultants, dyers, bleachers, cleaners, chemists, druggists, drysalters, oil and colour men, etc. A subscriber, G. H. E. Goodman, 52, Bedford Square, London, W.C.